INTERNATIONAL SOCIETY FOR SOIL MECHANICS AND FOUNDATION ENGINEERING

MINUTES OF THE EXECUTIVE COMMITTEE MEETING HELD IN MOSCOW

2nd, 3rd August, 1973

09.00-14.00 and 15.00-17.00 each day

PRESENT

| | | |
|---|---|---|
| President | Prof. R.B. Peck | |
| Vice-Presidents | - | Africa |
| | - | Asia |
| | Prof. E.H. Davis | Australasia |
| | Prof. E.E. de Beer | Europe |
| | Dr. D.H. Macdonald | N.America |
| | - | S.America |
| Secretary General | Prof. J.K.T.L. Nash | |

| National Society | Voting Representative | Non-Voting Representative |
|---|---|---|
| Argentina | - | |
| Australia | V-P | |
| Austria | Dr.M. Fross | |
| Belgium | V-P | |
| Brazil | Mr. S. Golombek | |
| Bulgaria | Prof. G. Stefanoff | |
| Canada | Mr. C. Crawford | Prof. G. Meyerhof |
| Chile | - | |
| China | - | |
| Colombia | - | |
| Czechoslovakia | delegate of Hungary | |
| Denmark | - | |
| Ecuador | - | |
| Finland | delegate of Sweden | |
| France | Prof. J. Kerisel | |
| G.D.R. | Prof. W.W. Rattay | Mr. Bittniok |
| German Federal Republic | Dr. H.W. Koenig | Dr. I.H. Idel |
| Ghana | - | |
| Greece | Prof. D. Valalas | Mr. D. Frankidakis |
| Hungary | Prof. A. Kézdi | |
| India | Prof. S. Prakash | Prof. D. Mohan |
| Iran | - | |
| Ireland | - | |
| Israel | - | |
| Italy | Prof. A. Croce | Prof. C. Viggiani |
| Japan | Prof. M. Fukuoka | Prof. Y. Yoshimi |
| Mexico | Dr. B. Simpser | |
| Morocco | - | |
| Netherlands | - | |
| New Zealand | Mr. M.J. Pender | |
| Norway | delegate of Sweden | |
| Pakistan | - | |
| Peru | - | |
| Poland | Prof. Z. Wilun | Dr. W. Wolski |
| Portugal | Mr.Castel-Branco Falcao | |
| Rhodesia | - | |
| S.Africa | - | |
| S.E. Asia | Dr. J. Nelson | Prof.Chin Fung Kee |
| Spain | Prof. J.A. Jiminez Salas | Mr. V. Escario |
| Sweden | Dr. B. Broms | Mr. N. Flodin |
| Switzerland | Dr. B. Gilg | |
| Tunisia | - | |
| Turkey | Prof. Togrol | |
| U.K. | Mr. A.C. Meigh | Dr. A. Penman |
| U.S.A. | Dr. E. D'Applonia | |
| U.S.S.R. | Prof. N.A. Tsytovich | Yu. G. Trofimenkov |

| National Society | Voting Representative | Non-Voting Representative |
|---|---|---|
| Venezuela | - | |
| Yugoslavia | Prof. I. Sovinc | |

In addition the following were invited to attend all or part of the meeting and were present as observers:

The Secretary General of the International Association of Engineering Geology (Dr. Wolters)

Prof. Za-Chieh Moh (Vice-President elect)
Prof. R.J. Marsal (Vice-President elect)

In opening the meeting the President, Professor Peck, spoke of the tragic loss to the Society since our last meeting of the immediate Past-President, Dr. Laurits Bjerrum, and he asked members to stand in silence in his memory.

En ouvrant la séance Prof. Peck, Président, a parlé de la perte tragique pour la Société de son ex-Président, Dr. Laurits Bjerrum, et il a invité l'assistance à la commémorer par une minute de silence debout.

1. Apologies for absence were received with regret from the Vice-Presidents of Africa (Mr.dos Santos), Asia (Prof.Mogami) and South America (Mr.Perez Guerra).

1. Ont été reçues des excuses de la part des Vice-Présidents d'Afrique (Mr. dos Santos), d'Asie (Prof. Mogami) et d'Amérique du Sud (Mr. Perez Guerra).

2. A roll was taken of the various countries present which at the start of the meeting amounted to 17 and it was established that there were sufficient for a quorum for general business to be conducted (one-third necessary).

2. Vers le début de la première séance étaient présents les représentants de dix-sept pays, et il a été reconnu que le quorum (un tiers) étaient atteint.

3. The Secretary General reported that following the Sydney Executive Meeting (see Minute 4, Sydney) full application papers had been received from Ghana and, these being acceptable, Ghana had been accepted into membership. Ghana was formally welcomed as a new member as from 1st September 1972.

3. Le Secrétaire Général a rapporté que selon la résolution de la séance du Comité Exécutif tenu a Sydney (v.procés verbal N.4, Sydney), le Ghana est devenu membre de l'association à partir du 1 septembre 1972.

4. The Secretary General reported that following the Sydney meeting (see Minute 5, Sydney) he had been twice to Iran for discussions and that complete application papers had been received from the Iranian Geotechnical Society. He reported that these were in order, and Mr. Crawford proposed and Prof.de Beer seconded that Iran should be accepted into membership. This was adopted unanimously.

4. Le Secrétaire Général a informé le Comité que selon la décision du Comité Exécutif tenu à Sydney (v.procès verbal N.5, Sydney), il à été en Iran a deux reprises, pour discussions et présentation des doduments nécessaires. La documentation de la Société Géotechnique Iranienne est en ordre. M.Crawford a proposé et le Prof. de Beer l'a soutenu, l'admission de lIran au sein de la Société. Le vote a été unanime.

5. The Secretary General reported that following the Sydney Executive Committee Meeting he had sent a circular letter to each National Society asking for authority to be assigned to him to admit new countries into membership provided the overall requirements of the International Society appeared to have been met.

The replies were as follows;

5. Le Secrétaire Général a indiqué qu'il avait anvoyé une lettre à toutes les Sociétés Nationales concernant une délégation à lui d'admettre de nouveaux pays à la Société Internationale.

Il a reçu les réponses suivantes:

| | |
|---|---|
| Quantité totale des pays informés | 43 |
| Pour | 31 |
| Contre | 1 |

| | | |
|---|---|---|
| Total number of countries circulated | | 43 |
| In favour of designating right of admission to Secretary General | 31 | |
| Not in favour | 1 | |
| In favour of designating right for admission of Ceylon | 1 | |
| No replies received | 10 | |
| | 43 | 43 |

It was proposed by Dr. D'Applonia and seconded by Prof.de Beer that the Secretary General should continue to have this right for the next two years. This was accepted unanimously.

6. The Secretary General reported that he had had discussions in Budapest and in Dresden with the Officers of the G.D.R. Society of Soil Mechanics about their joining the International Society and that subsequent to the excellent symposium which they had run in Dresden a formal application had been received. This was fully in order and on the recommendation of Prof. Stefanoff, seconded by Prof.de Beer the G.D.R. National Society was unanimously accepted into membership.

7. The Secretary General reported that he had received an application for membership from Pakistan. The papers had been beautifully presented and on the proposal of Prof.de Beer seconded by Prof. Prakash it was unanimously agreed that Pakistan should be admitted as a new member.

8. The Secretary General reported that during 1971 he had received an application for membership from Ceylon. The papers had been well produced but he had written for clarification of a few points. No reply to his subsequent letters had been received and the application was therefore deferred.

9. The Secretary General reported that he had very recently received an application for membership from Romania. There were some queries arising from this application which had still to be answered and it was agreed that the right of admission should be delegated to the Secretary General as in Minute 5.

10. The Secretary General reported that he had recently received an application from Tunisia. The papers were in correct order and on the proposal of Mr. Pender, seconded by Prof. de Beer, it was unanimously agreed that Tunisia should be admitted as a new member.

**Pour l'admission de Shri Lanka (Ceylon) 1**
**Pas de réponses 10**

**Le Prof. D'Apollonia a proposé et le Prof. de Beer l'a soutenu, de donner un tel droit au Secrétaire Général pour les deux ans à venir.**
**Adopté à l'unanimité.**

6. **Le Secrétaire Général a indiqué qu'il avait du des négociations avec les dirigeants de la Société Nationale de la R.D.A. à Budapest et à Dresde au sujet de l'admission de cette Société à l'SIMSTP. La demande d'admission a été formulée.**
**La demande étant formulée correctement, sur la recommendation du Prof. Stéfanov soutenue par le Prof. de Beer, la Société Nationale de la R.D.A. a été admise à l'unanimité.**

7. **Le Secrétaire Général a rapporté qu'il avait reçu la démande de Pakistan. Les documents étaient en bon ordre, et, sur la proposition du Prof. de Beer soutenue par le Prof. Prakash, il a été décidé à l'unanimité d'admettre le Pakistan à la Société Internationale.**

8. **Le Secrétaire Général a annoncé qu'en 1971 il avait recç la demande analogique de Ceylan. Les papiers étaient en bon ordre, mais il avait demandé une explication écrite de certains points. Il n'a recç aucune réponse, et la demande du Ceylan a été ajournée.**

9. **Le Secrétaire Général a annoncé que la demande de l'admission de Roumanie avait été récemment reque. Dans cette demande, il y a certains points à préciser. Il a décidé conformément au point 5 ci-dessus, de donner le droit de résoudre la question de l'admission au Secrétaire Général.**

10. **Le Secrétaire Général a rapporté qu'il avait récemment reçu la demande de la Tunisie. Les papiers sont en bon ordre, et sur la proposition de M.Pender, soutenue par le Prof. de Beer, il été unanimément décidé que la Tunisie serait admise. A été admis, par ailleurs, le Pakistan. Par contre, l'admission de Ceylan a été ajournée.**

11. The Secretary General introduced the report (Appendix I) on the list of Members prepared by Mr. Peter Lumb of the South East Asian Society of Soil Engineering. The quality of the list was generally approved and a special vote of thanks was passed to those who had worked so hard to produce it.

Prof. Davis suggested that titles would be a great help in a future list and it was agreed that one title only (e.g. Mr or Dr or Professor, etc., but not more than one) should be used, the choice being left to the person concerned.

Dr. D'Appolonia urged that in order to help the finances of the Society the use of advertisements should be increased for the next list and that this should include

(i) Professional cards
(ii) Manufacturers of equipment
(iii) Sub-professional services (drilling, exploration, laboratory testing, etc).

Prof. Kerisel considered that since professional advertising was not permissible in some countries it should first be checked that any group would not be placed at a disadvantage and that the Professional cards would have to be produced according to an agreed standard. Professor Tsytovich considered that the question of advertisements should be taken very seriously and that they should be approved by National Societies before submission for the list. Dr. Croce queried if the Society would be responsible for the accuracy of the statements made in the advertisements and it was agreed that this would not be so.

It was unanimously agreed that a sub-committee should be appointed by the President to report to the next Executive Committee on the use of Professional cards.

12. It was agreed that the next list should be produced in 1976. Dr. Nelson stated that the S.E. Asian Society of Soil Engineering would be happy to serve the International Society by producing the list should their prices still be competitive. Prof. Prakash indicated that the Indian Geotechnical Society would also be happy to produce quotations and samples and the Secretary General was asked to follow these offers at the appropriate time. Dr. Simpser suggested that the use of a computer and photo reduction techniques should also be considered and this was agreed.

It was also agreed that substantially more copies of the list should be

11. Le Secrétaire Général a présenté le rapport sur la Liste des membres préparée par M.Lumb de la Société d'Asie Sud-Est. La qualité de ce travail e été reconnue. Par un vote spécial, on a remercié tous ceux qui avaient travaillé d'arrache-pied a son élaboration (Voir l'annexe 1).
Le Prof. Davis éstime que l'indication des grades serait utile dans la liste prochaine.
Il a été convenu de ne mentionner qu'un seul titre (c'est-à-dire, soit M., soit Dr., soit Prof., etc. mais pas plus d'un), le choix du grade revenant au titulaire lui-même.
Afin d'améliorer la situation financière de la Société, le Dr. D'Apellonia a proposé d'avoir recours plus largement à la publicité dans la liste prochaine qui comprendrait.

(i) cartes professionnelles
(ii) producteurs d'équipements
(iii) services sub-professionnelles (forage, exploration, essais en laboratoire, etc.)

Comme la publication des cartes professionnelles n'est pas permise dans certains pays, le Prof. Kerisel estime que cette possibilité doit être d'abord vérifiée afin qu'aucun groupe de pays ne soit desavantagé et que les cartes professionnelles soient préparées selon une forme convenue.
Le Prof. Tsytovitch considère que cette question doit être sérieusement controlée et approuvée par les Sociétés Nationales avant introduction dans la liste.
Le Dr Croce a demandé si la Société serait responsable de l'exactitude des données communiquées, et il a été décidé que non. Il a été unanimement agréé que le Président doit désigner un Sous-Comité pour préparer un rapport au Comité Exécutif prochain sur la possibilité d'introduction des cartes professionnelles.

12. On a décidé que la liste prochaine est à publier en 1976.
Le Dr. Nelson a déclaré que la Société des Travaux de Fondations d'Asie Sud-Est serait heureuse de rendre service à la Société Internationale en préparant cette liste.
Le Prof. Prakash a indiqué que la Société Géotechnique Indienne tiendrait aussi pour une tâche agréable de réaliser un certain travail pour cette liste.
On a prié le Secrétaire Général d'en tenir compte en temps utile.
Le Dr. Simpser a proposé d'utiliser aussi l'ordinateur et les techniques de photoréduction.
On a considéré utile pour la prochaine fois d'augmenter substantiellement la quantité de tirages de la liste afin

produced next time to allow for an increase in members and for sending to potential advertisers and the Secretary General was asked to take this into account when the next list is produced. It would also be appropriate to advertise the list so that Universities and firms can purchase copies.

13. The Secretary General mentioned that discussions had been taking place about co-operation with the International Society for Rock Mechanics (ISRM) and the International Association of Engineering Geology (IAEG) and one topic which had been discussed by the Secretaries General was the production of a common list of members with appropriate designations. This was discussed briefly and some of those countries who have combined ISSMFE and ISRM National Societies considered that this would be helpful, though others felt the list might be rather cumbersome. It was agreed that for the present each Society should proceed with its own list but the Secretary General was encouraged to continue the discussion with ISRM and IAEG on the matter.

14. The Secretary General introduced the Statement of Income and Expenditure for the two years ended 28th February 1973 which was circulated in advance with the Agenda and is reproduced as Appendix II. The President proposed the adoption of the report and this was accepted unanimously.

15. The President informed members that in accordance with Minute 17 of the Sydney Executive Committee meeting he had set up a sub-committee to consider the finances of the Society. This consists of Dr. D'Appolonia (Chairman), Prof. Kerisel and Prof.Prakash, and he invited Dr. D'Appolonia to introduce their report.

In introducing the discussion Dr. D'Appolonia spoke of the various methods used by other Societies to assess their dues and he referred to the fact that small and less wealthy countries would find it much more difficult unless a flat per capita membership fee were adopted. The sub-committee suggested that the amount of the annual dues should be determined by adding together the three following sums which would be calculated separately for each member country, depending on the classification of the member country.

1. A sum per member country computed as a percentage, $p_1$, of the budget and equally divided among the member countries.

de tenir compte de l'accroissement des membres et le Secrétaire Général a été prié de prendre ceci en considération au cours de la préparation de la liste prochaine.
Il serait aussi raisonable de diffuser cette liste aux Universités et aux firmes industrielles.

13. Le Secrétaire Général a annoncé qu'une discussion sur la coopération avec la Société Internationale de Mécanique des Roches (ISRM) et l'International Association of Engineering Geology (IAEG) avait eu lieu. Les trois Secrétaires Généraux ont négocié la question d'une liste commune qui comprendrait les diverses appartenances.
Il s'est avéré que certains pays faisant partie de l'SIMSTF et de l'ISRM trouvaient cette liste souhaitable tandis que d'autres ne partageaient pas cette opinion. Il a été décidé que, pour le moment, chaque Société présentera sa propre liste, et on a recommandé au Secrétaire Général de continuer la discussion sur ce sujet avec l'ISRM et l'IAEG.

14. Le Secrétaire Général a présenté le rapport sur les recettes et les dépenses des deux années écoulées au 28 février 1973. Il a été joint au procès-verbal et distribué; il est réproduit dans l'annexe II. Le Président a proposé d'adopter le rappert et le voto a été unanime.

15. Le Président a informé le Comité que conformément au procès-verbal (17) de la séance de Sydney, il avait désigné un Sous-Comité comprenant le Dr.Apollonia (Président), le Prof. Kerisel et Prof. Prakash afin d'étudier les finances de la Société. Le Président a invité le Dr. D'Apollonia a prendre la parole. Il propose que les cotisations soient calculées ainsi:

1. Un montant par Société Nationale affiliée calculé comme un pourcentage $p_1$ du budget, et réparti uniformément par Société Nationale affiliée.
2. Un montant variable par Société Nationale affiliée et calculé comme le produit d'un pourcentage $p_2$ du budget avec le pourcentage du nombre de membres de la Société Nationale affiliée au nombre total de membres de toutes les Sociétes Nationales affiliées.
3. Un montant variable par Société Nationale affiliée, calculé comme le produit d'un pourcentage $p_3$ du budget avec le coefficient d'importance de chaque pays affilié, com-

2. A variable sum per member country computed as a percentage, $p_2$, of the budget times the percent of number of members per member country to the total number of members of member countries.

3. A variable sum per member country computed as a percentage, $p_3$, of the budget times the percent rating of the member country as determined by the World Bank's Gross National Product per capita rating of the member countries.

4. The percentages, $p_1$, $p_2$ and $p_3$ of total annual budget should be set by the Committee.

and possible ways of interpreting this were shown in 3 tables.

Prof. Prakash pointed out that the 1965 increase from US$ 0·25 to US$ 0·75 per member had brought about a drastic drop in the membership of the Indian National Society and a further increase might well reduce our overall membership.

Dr. Nelson enquired if the question of institution membership had been looked at by the Sub-Committee and whether or not the International Society should not receive some income from this source. If we received even $50 from some 300 institution members this would give us an additional income of $15,000.

The Secretary General gave a rough estimate for the future annual expenditure as follows:

| | |
|---|---|
| Secretariat | $14,000 |
| Travel etc | 7,000 |
| List of members (net) | 4,000 |
| Contingencies | 1,000 |
| | $26,000 (U.S.) |

He pointed out that the costs of running the Society had hitherto been carried to a large extent by the Institution of Civil Engineers and it was now going to be necessary for the costs to be realistically borne by ISSMFE. On the proposal of Dr. D'Appolonia, seconded by Mr. Meigh the estimate for $14,000 for the Secretariat was accepted (15-9) as a rough guide as to what was going to be required in the next two years.

On the proposal of Dr. D'Appolonia, seconded by Prof. Tsytovich it was agreed (13-10) that $7000 was an acceptable estimate for the annual expenditure on travel for the next two years.

On the proposal of Dr. D'Appolonia, seconded by Dr. Simpser it was agreed that $4000 should be laid aside for production of the List of Members and

me déterminé par le produit national par habitant, tel que fixé par la Banque Mondiale.

4. Les pourcentages $p_1$, $p_2$ et $p_3$ du budget total sont fixés par le Comité Exécutif.

Les expressions possibles de cette suggestion sont données dans trois tableaux.

Le Prof. Prakash a indiqué que l'augmentation de 25 cents à 75 cents par capita depuis 1965 provoque une certaine diminution du nombre de membres de l'Association Nationale Indienne et qu'une telle augmentation ultérieure pourrait réduire encore ce nombre.

Le Dr. Nelson demande si la question des membres collectifs a été discutée par le Sous-Comité et si la Société Internationale ne pourrait pas récevoir un certain apport de cette source. Si nous recevions même 50 dollars de chacun de quelques 300 membres collectifs, l'apport supplémentaire montérait à 15.000 dollars.

Le Secrétaire Général a donné à titre approximatif le calcul des dépenses annuelles à venir:

| | |
|---|---|
| Secrétariat | - 14.000 doll. |
| Voyages, etc. | - 7.000 |
| Liste de membres (nette) | 4.000 |
| Contingences | - 1.000 |
| | 26.000 dollars (USA) |

Il a indiqué que la Société est soutenue financièrement par l'Institution of Civil Engineers et que à présent il devient nécessaire de transférer cette charge à la SIMSTF. Sur la proposition du Dr. D'Appolonia soutenue par M.Meigh, on a adopté la somme de 14.000 dollars pour le Secrétariat. On croit qu'elle convient aux exigences des deux ans à venir.

Sur initiative de Dr. D'Appolonia soutenue par Prof. Tsytovitch, on est tombé d'accord sur la somme de 7.000 dollars pour les voyages pendant des deux années prochaines.

Sur la proposition du Dr. D'Appolonia soutenue par le Dr. Simpser on a décidé que 4.000 dollars doivent être réserves pour l'édition de la liste des membres et 1.000 dollars pour les contingences.

La somme totale de 26.000 dollars a été considérée alors comme une somme raisonnable bien que beaucoup de membres éstiment qu'une telle grande augmentation du budget puisse provoquer des difficultés relatives à l'admission de nouveaux membres aux Sociétés Nationales.

Le Comité s'est alors ajourné et a chargé le Sous-Comité y compris M.Meigh de rédiger les remarques et les corrections approprées.

$1000 for contingencies. The total of $26,000 was therefore considered by a majority to be a reasonable figure though many members considered that such a large increase in the budget could lead them into difficulties with their home memberships, especially as adequate notice of this increase had not been given.

The Committee adjourned at this point and the Sub-Committee, with Mr. Meigh added, was asked to bring in revised proposals.

16. Mr. Meigh introduced the notes which are attached to the Minutes as Appendix III. Mr. Meigh pointed out that two possible budgets were being allowed for

(a) $26,000 as agreed in Minute 15
and
(b) $20,000 if pruning were felt necessary.

The suggestion is that the total dues for a country should be fixed and it should be left to the country the precise method of raising the amount, either by dividing the sum equally between members or by having industrial members or by other means.

Mr. Meigh wished to add to the report, as tabled a requirement that a notional minimum number of members should be decided for each National Society, either in proportion to the number of civil engineers in that country, or on some other reasonable basis. The purpose of this would be to prevent National Societies from reducing their membership in order to reduce their total subscription.

Prof.de Beer agreed in principle that measures should be taken to prevent this. He pointed out however that this should not be included in the motion, as it would then not be in accordance with article 19 of the By-Laws, since this article refers to "The number of members in the National Society being that at the time the payment is due". He suggested that this point should be treated as laid down in Articles 35 and 36 of the Constitution. That is to say, that any proposal concerning the fixing of a notional minimum number of members should be submitted in writing to the Secretary General early enough to have the proposal submitted to all National Societies at least three months prior to the next Executive Committee Meeting. In this way this important point could be considered at the next Executive Committee Meeting.

In the light of Prof.de Beer's comment, Mr. Meigh agreed to omit from the motion the point concerning a notional minimum

16. **M.Meigh présente le nouveau rapport (voir l'annexe IV au procès-verbal) et soulligne que deux budgets possibles peuvent être acceptés:**
**(a) 26.000 dollars US, comme il est indiqué dans le point 15**
**(b) 20.000 dollars US, il est nécessaire de diminuer le budget.**
**La proposition consiste à ce que seule la somme totale de la côtisation d'un pays soit fixée et que chaque pays puisse employer sa propre méthode pour la récouvrer, soit par la division de la somme en parties égales entre les membres, soit par le recrutement de membres industriels, soit par d'autres moyens.**

**Le Prlf. de Beer se demande si le Comité Exécutif a le droit de modifier le système de fixation des cotisations, établi par le By-Law 19. Le Président a fait lecture de ce By-Law et pense que ces propositions sont complétement acceptables. Le Prof. de Beer a exprimé son accord.**
**La proposition de M.Meigh d'accepter la rapport a été soutenue par Dr. Simpser.**
**Prof. Prakash a fait une objection contre la somme de 26.000 dollars du budget comme indiqué dans l'Annexe B(a) et a proposé 20.000 B (b). Le Prof. Kezdi et beaucoup d'autres se sont prononcés pour cette proposition.**
**M.Meigh a indiqué que la somme de 20.000 dollars peut être accepté sous la condition que le prix de la publication de la liste des membres soit payé par le pays-organisateur du prochain Congrès.**
**Le vote des amendements a été unanime.**
**Le Dr. Nelson a remarqué que l'Asie Sud-Est n'était pas introduite dans l'Annexe A. Il croit qu'elle devrait appartenir au Groupe 3, et il a proposé d'omettre la référence à l'O.N.U. Cette idée a été soutenue par Dr. D'Appolonia qui a proposé de remplacer cette référence à l'O.N.U. par SIMSTF/ONU. On a accepté cette proposition.**
**Puis on a voté le rapport avec le point (b) dans l'annexe B au lieu du point (a). Le rapport est adopté à l'unanimité. Ainsi en est tombé d'accord que la somme du budget soit fixé à 20.000 dollars US, ce qui est unanimement adopté.(1)**
**Conformément à cette décision, le By-Law 19 sera corrigé.**

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**(1) - sans décomposition imposée.**

number of members. The President confirmed that the motion would not then be contrary to the By-Laws.

Mr. Meigh proposed and Dr. Simpser seconded the adoption of the following motion:

"In accordance with By-Law 19, the new basis of subscriptions shall be as follows. The amount of the annual subscription of each member country shall be determined by adding together the two following sums:

Item 1 Fixed fee per member country, $100 US

Item 2 A variable sum depending on the latest scale of assessment adopted by the United Nations. The classification of the member countries into the eight groups under this item at the date of the approval of this revision of the basis of subscription is given in Appendix A. The amount payable in US dollars is given in Appendix B."

Prof. Prakash was unhappy about budgeting for $26,000 as in Appendix B(a) and proposed an amendment to delete this column. This was seconded by Prof. Kézdi and many spoke in support of it.

Mr. Meigh stated that the $20,000 budget was based on the assumption that the cost of printing the List of Members should be carried by the next Conference host country.

On the vote the amendment was carried nem con.

Dr.Nelson pointed out that S.E. Asia had not been specifically included in Appendix A: he thought it should probably be in Group 3 but he proposed that reference to the United Nations should be omitted. This was seconded by Dr. D'Appolonia.

Dr. D'Appolonia then suggested that ISSMFE/UN should be substituted in place of reference to the United Nations and this was agreed.

The adoption of the report using column (b) in Appendix B in place of column (a) was then voted upon and this was accepted unanimously. It was thus agreed that the budget should be amended to $20,000 without specifying the individual items and this was carried unanimously.

By-Law 19 will now be amended accordingly.

17. The Secretary General introduced the report on the French translation of the Statutes which had been prepared by Monsieur Florentin and Monsieur Mayer and which had been circulated with the Agenda. As these involve no change in meaning and on the proposal of Prof. Kerisel, seconded by Prof.de Beer, it was agreed that the new translation should be adopted for the next printing of the Statutes.

18. Dr. Broms mentioned that Sweden was still unhappy about the name of the Society and a brief discussion took place on this subject. The President recalled that it had been discussed at great length at Sydney when International Geotechnical Society had been considered as an alternative, but this was rejected as being too wide as it includes rock mechanics and engineering geology. Prof. Tsytovich preferred our present title as this includes 'foundation engineering'. It was agreed that no change should be made at present.

19. The proposal from Australia (Appendix IV) that an Institute for the publicity and exchange of geomechanics computer programmes should be set up was introduced by the Australasian Vice-President. He repeated the offer from CSIRO to run such an institute and this was warmly accepted on the understanding that it would not involve ISSMFE in any financial cost. He proposed that the President should be asked to set up a Sub-Committee to advise with respect to the scheme. This was seconded by Prof.de Beer and was carried unanimously.

20. Professor Prakash on behalf of the Indian National Society spoke of the feeling amongst his members that they receive very little for the dues they pay to ISSMFE and he wondered if they might not be sent something more tangible such as summaries of papers presented to our international conferences. He also wanted more information to be given to National Societies about the decisions of the Executive Committee. The President pointed out that membership of ISSMFE opened the door to wider participation in international soil mechanics and that he knew of no other international society which distributed such summaries. The Secretary General stated that full minutes of our meetings were always given to each person present, who was expected to report back to his appointing committee, and in addition a full set was posted independently to the National Society secretaries.

**17. Le Secrétaire Général a présenté le rapport sur la version française des Statuts préparée par M.M.Florentin et Mayer et distrubuée parmi les membres avec l'ordre du jour. Sur la proposition de Prof. Kérisel soutenue par Prof. de Beer, on est tombé d'accord sur la nouvelle version qui est acceptée pour la publication prochaine des Statuts.**

**18. Le Dr.Broms a noté qu'en Suède, on n'est pas satisfait de la dénomination de la Société. A la suite d'un bref échange de vues, le Président a rappelé que l'on avait discuté cette question à Sydney où, la dénomination "Société Internationale Géotechnique" avait été proposée.**
Cette proposition avait ete repoussee comme ayant un sens beaucoup plus large au regard de la mecanique des roches et de la geologie appliquee. Le Prof. Tsytovitch estime que la denomination actuelle est la plus acceptable car elle contient "les travaux de fondations". Il a ete dedice de ne faire aucun changement.

19. Le Vice-President de l'Australasie a exprime le souhait que l'Australie (voir l'Annexe 5) mette sur l'organisation d'un institut qui elaborerait et distribuerait les programmes pour les ordinateurs dans le domaine de la geomecanique. Il a expose la proposition CSIRO de se charger de l'organisation de tel institut. Cette proposition est acceptee sous reserve qu'elle n'apporte pas a la SIMSTF de depenses financieres. Il a propose de demander au President de nommer un sous-commission pour regler cette question. Le Prof. de Beer l'a soutenu. Le vote a ete unanime.

20. Au nom de la Societe Nationale Indienne le Prof. Prakash a expose le desir d'augmenter la quantite des materiaux d'information donnees a l'Inde en contrepartie de la somme de cotisations qu'elle paye a la SIMSTF et, en particulier, que chaque membre recoive les resumes des rapports des Congres Internationaux aussi que les comptes rendus concernant l'activite et les resolutions du Comite Executif. Le President a repondu que les membres de la SIMSTF ont une large possibilite de mecanique des sols et que les prestations fournies par notre Societe se comparent favorablement a d'autres. Le Secretaire General a note que les proces-vorbaux complets sont toujours distribues aux personnes presentes au Comite Executif afin qu'ils aient la possibilite de les presenter a leurs Comites Nationaux. En outre, le texte complet de documents est envoye separmenent aux Secretariats des Societes Nationales.

21. On behalf of the French National Society Prof. Kerisel proposed the co-ordination of activities of our Society with those of ISRM and IAEG and spoke of the meetings which have already taken place in Brussels between the three Secretaries General following the initiative of Professor de Beer.

Professor de Beer spoke of the close connection between these three Societies (which deal in fundamentals rather than in particular structures) and of the 40% overlap in membership. Following discussions with the President he had approached the Belgian Government who had generously made available the funds for preliminary meetings of the three Secretaries General to take place in Brussels and these were held in December 1972 and May 1973.

Dr. Wolters spoke on behalf of IAEG and indicated that the proposed statutes would be discussed at the next meeting of his Society's Executive Committee when he hoped they would be approved.

Prof. Kerisel moved the adoption of the draft Statutes which had been circulated with the Agenda (Appendix V) and this was seconded by Prof. Stefanoff. Dr. Koenig considered that this new move was greatly to be welcomed and that Prof.de Beer was to be greatly thanked for the hard work he had done in this connection. It was specially welcomed that this new Secretariat would be no expense on our Society. The proposal was adopted unanimously.

22. Dr. MacDonald reported that in 1970 UNESCO had invited our Society, along with seven other Societies, to create a working group on Seismic Phenomena associated with Large Reservoirs and that the President had invited him to be our representative on the group. The group has so far met three times and a future meeting is planned in Canada in 1975. All expenses are being met by UNESCO.

Dr. MacDonald was thanked for the work he has done on our behalf and he agreed to represent us at the Canadian meeting.

23. Dr. MacDonald reported that UNESCO had set up a consultative committee of experts on Strong Ground Motion due to Earthquakes and had invited us to appoint a member to it. The President had asked Professor Morgenstern to undertake this task and in his absence Dr.MacDonald summarised Professor Morgenstern's report on the meeting which had taken place in 1971.
Professor Morgenstern was thanked for his service (which again had involved

21. Au nom de la Societe Nationale Francaise, le Prof. Kerisel a propose d'etablir une certaine coordination de l'activite de notre Societe avec la SIMR et la ISEG et a parle de la rencontre des trois Secretaires Generaux organisee a Bruxelles a l'initiative du Prof. de Beer. Le Prof. de Beer a parle de contacts entre les trois Societes mentionnees /qui realisent une coordination plutot sur les problemes principaux que sur les questions particulieres;40% des personnes concernees appartiennent a plusieurs des trois societes.

Apres quelques entretiens avec le President il s'est adresse au gouvernement Belge qui a immediatement assure les moyens materiels pour les rencontres preliminaires des trois Secretaires Generaus a Bruxelles qui ont eu lieu en

decembre 1972 et en mai 1973.

Le Dr. Wolters a pris la parole au nom de l'ISEG et a indique que les Statuts proposes pour le Secretariat permanent seront discutes a la seance prochaine du Comite Executif de cette Societe et, comme il l'espere, ils seront adoptes.

Le Prof. Kerisel a propose d'accepter le projet des Statuts qui ont ete distribues aux participants avec l'ordre du jour (voir l'Annexe YI).Cette proposition a ete soutenue par Prof. Stefanoff. Dr.Konig estime qu'elle doit etre accueillie avec entrhousiasme et aussi qu'il avait accompli a ce sujet. On a particulierement approuve le fait que la Societe ne aurait pas depenses pour ce nouveau Secretariat. La proposition a ete adoptee a l'unanimite.

22. Dr.MacDonald a annonce qu'en 1970 l'UNESCO avait invite notre Societe avec sept autres associations a organiser un groupe de travail sur les phenomenes sismiques induits par les grandes retenues d'eau.

Le President lui a propose d'etre notre representant a ce groupe qui a deja tenu deux seances. Sa reunion prochaine est prevue en 1975 a Banff - L'UNESCO s'est chargee de toutes les depenses.

Dr.MacDonald a ete remercie pour son travail et il a accepte la proposition representer la SIMSTF a la reunion a Banff.

23. Dr.MacDonald a indique que l'UNESCO avait cree le Comite Consultatif d'experts sur les grands mouvements des sols due aux seismes et nous avait prie de designer un membre.Le President a prie le Prof. Morgenstern de se charger de cette responsabilite. En raison de son absence. Dr.MacDonald a lu son rapport pour la seance tenue en 1971.On a remer-

the Society in no financial expenses) and it was hoped that he would be willing to continue to represent us on the Committee.

24. The Secretary General reminded the Committee that discussions had taken place in Mexico about our continued membership of UATI and since the Sydney meeting he had been advised by Monsieur Mayer and Dr. Chamecki that we were unlikely to receive further funds from them and that we should resign. He had consulted with the President and since the end of 1972 we no longer belonged to UATI.

25. The Vice-President for North America (Dr. MacDonald) reported on the activities of the member societies in the region in the last four years. His written report is attached to the Minutes as Appendix VI.

26. The Vice-President for Australasia (Prof. Davis) reported on the activities of the Australian and New Zealand Societies in the last four years. His written report is attached to the Minutes as Appendix VII.

27. The Vice-President for Europe (Prof.de Beer)reported on the activities of the many European member countries. His written report is attached to the Minutes as Appendix VIII.

28. The President commented that the three reports which we had heard indicated the Society in their regions was continuing to go from strength to strength and in the absence of the other three Vice-Presidents he was certain that members would be happy to read of similar progress in the remainder of the world when the other reports were published with the Minutes.
(Africa - Appendix IX;
South America - Appendix X;
Asia - Appendix XI).

29. The President spoke of the unanimous nomination of Professor Jean Kerisel as next President of ISSMFE (1973-77) and this was confirmed by unanimous vote. Professor Kerisel warmly thanked members for their support and expressed his earnest desire to serve our Society to the best of his endeavour.

30. The President reported on the postal elections for Vice-Presidents for the period 1973-77 which had taken place and the new appointments were approved unanimously as follows:

cie Prof. Morgenstern Pour son travail (qui n'entrainait aucunes depenses de la part de la Societe) et on a exprime l'espoir qu'il continue de representer notre Societe dans ce Comite.

24. Le Secretaire General annonce que depuis 1972 suivant en cela les avis donnes par Mr.Mayer et par M.Chernecki, nous avons donne notre demission de l'UATI.

25. Dr.MacDonald, Vice-President d'Amerique du Nord a fait l'etat de l'activite des societes-membres de cette region pour les quatre ans ecoules. Son rapport figure a l'Annexe YII du proces-verbal.

26. Prof. Davis, Vice-President d'Australasie a presente le rapport de l'activite des Societes, d'Australie et de Nouvelle Zelande pour la meme periode figure a l'Annexe YIII.

27. Prof. de Beer, Vice-President d'Europe a presente le rapport de l'activite de plusieurs Societes europeennes. Son rapport figure a l'Annexe IX.

28. Le President a remarque que les trois rapports presentes par les trois Vice-Presidents indiquent que la Societe continue de se renforcer dans ces regions et que, malgre l'absence des trois autres Vice-Presidents, il est sur que les membres seront heureux de lire tous les rapports qui seront publies au proces-vierbal (Annexe X-Amerique du Sud, Annexe XI-Asie).

29. Le President confirme la proposition postale unanime du Prof. Jean Kerisel comme prochain President (1973-77).Cette proposition a ete confirmee par un vote unanime.

Le Prof. Kerisel a chaleureusement remercie les membres du Comite Executif pour leur confiance et a exprime son tres grand desir sincere de servir la Societe du mieux qu'il le pourra.

30. Le President a annonce l'election postale des Vice-Presidents pour 1973-77 et ces designations ont ete approuvees unanimement:

Afrique Dr.J.W. de Graft Johnson (Ghana)
Asie Prof.Z.-C.Moh (Asie S.-E.)
Australasie Prof. P.W.Tayler (N.Zelande)
Europe Prof. A.Kezdi (Hongrie)
Amerique N. M.Prof. R.J.Marsal(Mexique)
Amerique S. Prof.V.F.B.de Mello (Bresil)

| | | |
|---|---|---|
| Africa | Dr.J.W.de Graft Johnson | (Ghana) |
| Asia | Prof. Z-C Moh | (S.E.Asia) |
| Australasia | Prof. P.W. Taylor | (New Zealand) |
| Europe | Prof. A. Kézdi | (Hungary) |
| N.America | Prof. R.J. Marsal | (Mexico) |
| S.America | Prof. V.F.B.de Mello | (Brazil) |

31. The President spoke of the invitations which had been received from India, Japan and the Federal Republic of Germany for the 1977 Conference and asked the representatives of these countries to extend the invitations so that they could answer any questions which members might wish to raise. Dr.MacDonald asked for assurances about By-Law 15 which states that all our members should be able to attend the Conference without discrimination and this was given by Professor Prakash, Professor Fukuoka and Dr. Koenig.

The voting was as follows:

| | |
|---|---|
| Federal Republic of Germany | 9 |
| India | 3 |
| Japan | 17 |
| Blank | 1 |
| | 30 |

The decision for the Conference to be held in Japan was met with acclamation.

32. The Secretary General spoke of the two invitations which had been received for the next Executive Committee meeting in 1975, from Israel and South Africa and of a third from Turkey which had since been received.

The voting was as follows:

| | |
|---|---|
| Israel | 1 |
| South Africa | 3 |
| Turkey | 23 |
| Blank | 3 |
| | 30 |

and the Turkish invitation for the Executive Committee meeting to be held in Istanbul either in July or September 1975 was accepted with acclamation.

33. Dr. D'Appolonia spoke of the necessity for long-term planning in connection with our International Conferences and of the desire of the United States National Committee to act as hosts in 1985 - the Golden Jubilee of our Society which held its first Conference in 1936. He pointed out that to act as host to such a conference nowadays involves raising a very large sum of money - $\$^1/_4$M now

31. Le President a parle des invitations recues de l'Inde, du Japon et de la Republique Federale Allemande pour le Congres de 1977 et a prie les representants de ces pays de commenter leurs invitations et de repondre a toutes les questions des membres de la Societe. Le Dr. MacDonald leur a demande de confirmer le By-Law 15 etablissant que tous les membres de notre Societe peuvent prendre part au Congres sans discrimination. Le Prof. Prakash, le Prof. Fukuoka et le Dr. Konig l'ont confirme. Les resultats du vote sur cette question sont:

| | |
|---|---|
| R.F.A. | 9 |
| Inde | 3 |
| Japon | 17 |
| Bulletin nul | 1 |
| Total: | 30 |

La decision de tenir le Congres prochain au Japon a ete accueillie par acclamation.

32. Le Secretaire General a annonce deux invitations reques pour la seance prochaine du Comite Executif (1975), de l'Israel, de l'Afrique du Sud, et aussi celle de la Turquie qui vient d'etre recue.
Le Dr. Togrol a commente cette invitation de la Turquie et confirme que chaque pays-membre pourrait prendre part a la seance sans discrimination. Le Secretaire General a annonce que confirmation semblable a ete egalement recue de l' Afrique du Sud. Les resultats du vote sur cette question:

| | |
|---|---|
| Israel | 1 |
| Afrique du Sud | 3 |
| Turquie | 23 |
| Bulletins nuls | 3 |
| Total : | 30 |

L'invitation de la Turquie de tenir le Comite Executif a Stamboul en juillet ou en septembre 1975 a ete accueillie par acclamation.

33. Le Dr.D'Appolonia a parle de la necessite de planification a long terme de nos Congres Internationaux et a exprime le desir que le Comite National des Etats-Unis soit organizateur du Congres en 1985 a l'occasion du cinquantenaire

and perhaps $\$^1/_2$M in 1985. This is normally raised as follows:

| | |
|---|---|
| Conference dues | 1/3 |
| Members of host country | 1/3 |
| Government of host country | 1/3 |

but in the United States Government financial support is lacking and two-thirds of the funding would therefore have to come from the members of the U.S. National Committee. To raise such a sum needs a long period of time and he therefore proposed the following motion

> "that this Executive Committee shall show in its Minutes that the USA will receive No.1 priority as hosts for the 1985 Conference".

This was seconded by Professor Stefanoff. Professor Mohan was against making such a firm commitment at this stage and Professor Davis suggested as an amendment

> "that the Executive Committee views with favour at this juncture that the Conference in 1985 should be held in the U.S.A."

This was seconded by Prof.de Beer and the amended motion was carried with only one country dissenting.

34. The President referred to the report of the Conference Advisory Committee which had been presented to the Sydney Executive Committee and stated that it is now our policy to carry out its recommendations in planning the 1977 Conference. Professor Kerisel concurred with this and added that topics and speakers for the conference should be arrived at by a concensus of the opinions of the National Societies working through the Executive Committee, meeting in Istanbul in 1975. Dr.MacDonald, who had been Chairman of the Committee agreed with this procedure.

35. A written report on the work of the Committee on Symbols and Units was received from Dr. Golder, its Chairman. The report followed largely the one previously presented to the Sydney Committee and is attached as Appendix XII. Dr. Broms spoke of the desirability of using $kN/m^2$ as the unit of pressure and this view was generally endorsed by the meeting.

36. A written report on the work of the Sub-Committee on Soil sampling was submitted by Dr. Aitchison, and Dr.Broms spoke to it briefly. The report is attached as Appendix XIII. The Sub-Committee is proposing to have a final meeting in Hawaii in 1975.

de notre Societe qui avait tenue son premier Congres en 1936. Il a souligne que l'organisation d'un Congres pareil, de nos jours, exige tres grandes depenses montant a 250.000 dollars aujourd'hui et peut etre 500.000 dollars en 1985.La somme totale comprend les depenses suivantes:

| | |
|---|---|
| Cotisations d'inscription | I/3 |
| Participants officiels du pays-organisateur | I/3 |
| Allocations gouvernementales du pays-organisateur | I/3 |

mais, comme on ne peut pas compter sur le support financier du gouvernement americain, il faut que 2/3 de finances necessaires soient recues des membres du Comite Ntional Americain. Afin d'accumuler une somme pareille, un grand delai de temps est necessaire, et c'est pourquoi Dr. D'Appolonia a fait la proposition suivante:

"Le Comite Executif notera dans son proces-verbal que les Etats-Unis ont priorite pour organiser le Congres en 1985". Cette proposition a ete soutenue par le Prof. Stefanoff. Le Prof. Mohan a eleve une objection contre une formulation aussi ferme. Le Prof. Davis a propose l'amendement suivant:

"Le Comite Executif considere avec faveur que le Congres de 1985 puisse etre organise aux Etats-Unis". Cette formulation a ete soutenue par Prof. de Beer, et la resolution corrigee a ete accepte presque unanimement (une voix contre).

34. Le President a evoque le rapport du Comite Consultatif de l'organisation des Congres qui avait ete presente au Comite Executif a Sydney, et il a indique qu'il est necessaire de preparer les recommendations relatives au Congres de 1977.Prof. Kerisel l'a soutenu et ajoute que les themes et les rapporteurs devraient etre choisis en accord avec les positions des Societes Nationales a la reunion a Stamboul en 1975.Dr.MacDonald, President du Comite, a accepte cette procedure.

35. Le rapport ecrit sur l'activite du Comite de Symboles et d'Unites a ete recu du Dr. Colder, son President. De rapport est tout a fait conforme au rapport soumis au Comite a Sydney et est place a l'Annexe XII. Le Dr.Broms a indique au'il est desirable d'utiliser le $kN/m^2$ comme unite de pression, et ce point de vue a ete approuve par la majorite des membres.

36. Le rapport ecrit de l'activite du Sous-Comite de la prise d'echantillons de sols, prepare par Dr. Aitchison et Dr. Broms, a ete presente brievement et est place a l'Annexe XIII Le Sous-Comite prevoit tenir une reunion finale aux Hawaii en 1975.

37. A report on the work of the Information Advisory Committee was received from its Chairman, Mr. J. de Salvo and this was presented by Mr. Flodin, a member of the Committee. He spoke of the continuing success of Geotechnical Abstracts (G.A.) produced by the German Federal Republic National Society and of the Geodex Retrieval System (G.R.S.) both of which are officially sponsored by ISSMFE. Regretfully the number of subscribers has not risen as had been hoped and it has therefore been necessary to increase the subscription price for both G.A.and G.R.S. The report is attached as Appendix XIV and member countries are urged to assist the promotion of these valuable ventures in the manner suggested in the Report.

The President said that the policy of the Society was to support fully the activities and the products of this Information Advisory Committee and this was fully accepted by the Executive Committee.

Prof.Moh spoke of the new storage and retrieval system being produced by the Asian Information Centre for Geotechnical Engineering and stated that there was no intention to provide any alternative to G.A. or G.R.S. but to complement it and Dr. Nelson endorsed this by pointing out that the S.E. Asian Society had offered free advertising space to these bodies in its Journal. The service was for engineers in the region and would include reports and information particularly relevant to their needs and the President observed that he and many others of the members present had cognisance of the scheme as it developed. The organisers of Asian Information Centre for Geotechnical Engineering and the members of the Information Advisory Committee were encouraged to meet during the Moscow Conference.

The report with amendments to the text was adopted.

37.Le rapport de l'activite du Comite Consultatif d'information a ete recu de M.I. de Salvo, son President, et a ete lu par M.Flodin, membre du Comite. Il a marque le succes des Abstracts Geotechniques (G.A.) publies par la Societe Ntionale de la R.F.A. et du Retrieval System "Geodex", tous les deux sous le patronage de la SIMSTF.Malheureusement, le nombre de souscripteurs n'est pas suffisant, et il est necessaire d'augmenter la prix des editions. Le rapport est place a l'Annexe XIY, et les pays-membres devient contribuer a la diffusion de ces publications comme il est indique dans le rapport. Le President a dit que la Societe soutenait l'activite du Comite Consultatif d'information dont le rapport a recu l'approbation du Comite Exectif. Le Prof. Moh a parle du nouveau "storage and retrieval system" etabli par le "Systeme Asiatique d'Information" et il a indique qu'il n'y avait pas d'intentions de concurrence avec le G.A. ou le G.R.S.,mais bien de les completer. Le Dr. Nelson l'a confirme en indiquant que la Societe d'Asie Sud-Est avait reserve une publicite gratuite pour ces organismes dans sa revue.

Les informations au systeme sont utiles pour les ingenieurs et comprennent toutes les donnees necessaires pour eux. Le President a indique que lui-meme et beaucoup d'autres parmi les presents sont au courant du systeme et de son developpement. On a propose aux auteurs du Systeme Asiatique d'Information et aux membres du Comite Consultatif d'Information d'organiser une seance conjointe pendant le Congres de Moscou.

Le rapport a ete adopte avec des correction de texte.

38. The President, in consultation with Professor Kerisel agreed that the following new Committees should be appointed:

(i) A Sub-Committee to deal with advertisements in the List of Members (including Professional cards)

(ii) A new Conference Advisory Sub-Committee to act for the next four years.

(iii) A Budget and Finance Sub-Committee to make recommendations on the subject of dues

38.Le President, apres consultation avec Prof. Kerisel, a pris decision d'organiser les nouveaux sous-Comites suivants:

1.Sous-Comite de publicite dans la liste des membres de la Societe (cartes professionnelles).

2.Sous-Comite Consultatif pour la preparation du Congres prochain.

3.Sous-Comite budgetaire et financier pour l'elaboration des recommendations relatives aux souscriptions.

4.Sous-Comite relatif au CSIRO (Banque des Programmes d'ordinateurs).

(iv) A Sub-Committee to advise CSIRO on the Institute for the publicity and exchange of geomechanics computer programmes.

It was agreed that the members of these committees need not be named at this juncture and delegates were invited to make suggestions as to names of suitable persons to serve either to the President or to Professor Kerisel.

39. The President proposed that Prof.Nash should be appointed as Secretary General for the period 1973-1977 and this was unanimously approved. He pointed out that it would be very difficult for a new President to take over at the same time as a new Secretary General. In his reply of thanks Professor Nash spoke of the pleasure he had obtained from working for the President and the Society and he gave notice that at the interim Executive Committee after the next Conference he would be planning to retire.

Dr. D'Appolonia asked that attention be given to the question of continuity at our next meeting in Turkey.

40. Professor Peck spoke of the great unhappiness which had been caused by the absence of the delegates from certain countries, in particular South Africa, Israel and Rhodesia, despite the strenuous efforts which had been made to secure their attendance.

41. The meeting closed at 18.15.

Signed in and on behalf of the Executive Committee

Ralph B. Peck,
President

Les membres de ces comites ne seront pas nommes pour le Moment, et les delegues sont pries de faire leurs propositions de personnes a designer soit au President, soit au Prof. Kerisel.

39. Le President a propose que le Prof.Nash soit nomme Secretaire General pour les annees I973-I977. Cette proposition a ete approuvee a l'unanimite. Il a souligne particulierement, que le remplacement simultane du President et du Secretaire Gneneral provoquerait des difficultes serieuses. En reponse, Prof. Nash a dit qu(il est tres satisfait de son travail conjoint avec le President et dans la Societe en general mais il a indique qu(il a L'intention de se demissionner apres le Congres suivant.

Le Dr.D'Appolonia a demande qu'au cours de la reunion prochaine en Turquie on prete une attention particuliere a la question de continuite des cadres dirigeants.

40.Le Prof. Peck a exprime son regret de l'absence des delegues de certains pays, en particulier, de l'Afrique du Sud, de l'Israel et du Portugal, malgre tous les efforts en vue de garantir leur presence.

4I.La seance a ete close a I8 h. I5min. le 3 aout I973.

Au nom du Comite Executif

Ralph B.Peck,
President

APPENDIX

MEMBERSHIP AT 1st January 1974

| | Europe | Asia | Africa | North America | South America | Australasia | Total |
|---|---|---|---|---|---|---|---|
| Argentina | - | - | - | - | 97 | - | 97 |
| Australia | - | - | - | - | - | 494 | 494 |
| Austria | 47 | - | - | - | - | - | 47 |
| Belgium | 83 | - | - | - | - | - | 83 |
| Brazil | - | - | - | - | 132 | - | 132 |
| Bulgaria | 92 | - | - | - | - | - | 92 |
| Canada | - | - | - | 542 | - | - | 542 |
| Chile | - | - | - | - | 23 | - | 23 |
| China | - | 100 | - | - | - | - | 100 |
| Colombia | - | - | - | - | 17 | - | 17 |
| Czechoslovakia | 35 | - | - | - | - | - | 35 |
| Denmark | 72 | - | - | - | - | - | 72 |
| Ecuador | - | - | - | - | 39 | - | 39 |
| Finland | 103 | - | - | - | - | - | 103 |
| France | 260 | - | - | - | - | - | 260 |
| F.R.G. | 900 | - | - | - | - | - | 900 |
| G.D.R. | 23 | - | - | - | - | - | 23 |
| Ghana | - | - | 25 | - | - | - | 25 |
| Greece | 48 | - | - | - | - | - | 48 |
| Hungary | 25 | - | - | - | - | - | 25 |
| India | - | 446 | - | - | - | - | 446 |
| Iran | - | 30 | - | - | - | - | 30 |
| Ireland | 6 | - | - | - | - | - | 6 |
| Israel | - | 114 | - | - | - | - | 114 |
| Italy | 456 | - | - | - | - | - | 456 |
| Japan | - | 221 | - | - | - | - | 221 |
| Mexico | - | - | - | 277 | - | - | 277 |
| Morocco | - | - | 140 | - | - | - | 140 |
| Netherlands | 82 | - | - | - | - | - | 82 |
| New Zealand | - | - | - | - | - | 168 | 168 |
| Norway | 188 | - | - | - | - | - | 188 |
| Pakistan | - | 27 | - | - | - | - | 27 |
| Peru | - | - | - | - | 38 | - | 38 |
| Poland | 30 | - | - | - | - | - | 30 |
| Portugal | 167 | - | - | - | - | - | 167 |
| Rhodesia | - | - | 224 | - | - | - | 224 |
| South Africa | - | - | 418 | - | - | - | 418 |
| S.E.Asia | - | 188 | - | - | - | - | 188 |
| Spain | 170 | - | - | - | - | - | 170 |
| Sweden | 259 | - | - | - | - | - | 259 |
| Switzerland | 624 | - | - | - | - | - | 624 |
| Tunisia | - | - | 15 | | - | - | 15 |
| Turkey | 42 | - | - | - | - | - | 42 |
| United Kingdom | 819 | - | - | - | - | - | 819 |
| U.S.A. | - | - | - | 734 | - | - | 734 |
| U.S.S.R. | 214 | - | - | - | - | - | 214 |
| Venezuela | - | - | - | - | 177 | - | 177 |
| Yugoslavia | 78 | - | - | - | - | - | 78 |
| Countries | 24 | 7 | 4 | 4 | 7 | 2 | 48 |
| Members | 4823 | 1126 | 807 | 1568 | 523 | 662 | 9509 |

## APPENDIX I

### Publication of ISSMFE List of Members, 1972

At the Executive Committee Meeting of August 1971 the Southeast Asian Society of Soil Engineering offered to supervise publication of the List of Members, on behalf of ISSMFE. A quotation for printing from Libra Press, Hong Kong, was accepted in September 1971 by the Secretary General, ISSMFE.

Editing was carried out by Mr P. Lumb in Hong Kong. Due to his absence from Hong Kong during April to August 1972 about one-third of the first proof and all the final proof was checked by Dr J.D. Nelson and Dr Z-C Moh of A.I.T. in Bangkok.

### Editorial Work

Lists of members of the National Societies were called for in August 1971 with the intention that printing would commence in January 1972. Half of these lists were received in Hong Kong during January but the complete text was not received until mid-March 1972.

The majority of the lists had been well prepared and needed little editing. The total editing time was approximately 12 working days.

### Printing

Printing commenced in February 1972. Some delay occurred due to lack of diacritical marks for German, Slavic, Scandinavian, Turkish, etc., alphabets, which had to be ordered by the printer.

Two-thirds of the first proof had been checked in Hong Kong by March, and the remaining one-third and the entire final proof checked in Bangkok by July 1972.

A total edition of 9,500 copies was printed by September 1972.

### Despatching

Packing and despatching was carried out by the printer. Lists to societies with small membership were sent by surface mail while lists to societies with large memberships were sent by sea freight.

Considerable difficulties arose in shipping freight to certain countries from Hong Kong and this caused unavoidable delays. Shipping was not completed until January 1973.

Although the printer had been instructed to insert the Geotechnical Abstracts brochure into each copy of the List of Members, this was unfortunately not done; the brochures merely being included with the lists.

## APPENDIX II

### ISSMFE INCOME AND EXPENDITURE 1971 - 1973

| | Year ended 28th February 1972/73 |
|---|---|
| | $ |
| **RECEIPTS:** | |
| Carried forward | 13,370.25 |
| Subscriptions (including Arrears) | 19,301.32 |
| | 32,671.57 |
| **EXPENDITURE:** | |
| List of Members | 11,944.12 |
| U.A.T.I. 1970-1971 | 344.06 |
| Audit fee 1970-1971 | 120.00 |
| Travelling expenses | 3,607.32 |
| Central Office | 11,103.07 |
| | 27,118.57 |
| Balance forward | $5,553.00 |

## APPENDIX III

### NOTES

In accordance with bye-law 19, the new basis of subscriptions shall be as follows. The amount of the annual subscription of each member country shall be determined by adding together the two following sums:

Item 1 Fixed fee per member country, $100 US

Item 2 A variable sum depending on the latest scale of assessment adopted by the United Nations. The classification of the member countries into the eight groups under this item at the date of the approval of this revision of the basis of subscription is given in Appendix A.

The amount payable in US dollars is given in Appendix B.

### EXPLANATORY NOTES

1. With $26,000 budget
   Item 1 $5,000
   Item 2 $21,000 ... ... column (a)

2. With $20,000 budget
   Item 1 $5,000
   Item 2 $15,000 ... ... column (b)

3. TOTAL SUBSCRIPTION PER NATIONAL SOCIETY

$$= \$\ n \times \left[\frac{100}{n} + \bar{x}\right]$$

where n = number of members in national society and x is given in column (5) of Table III

OR $$= \$100 + y$$

where y is given in column (4) of Table III.

 Appendix A

### SUBSCRIPTION - ITEM 2

Classification of member countries into eight groups depending on the Scale of Assessment Adopted by the United Nations for each country as a member of the United Nations Organisation

Note: The percentage shown against each country thus (1.30) is the Scale of Assessment payable to the United Nations during the years 1968-1970 and is based generally on "Capacity to pay" of each country.

| | | | |
|---|---|---|---|
| GROUP 1 | Percentage 0 to 0.10 per cent | | |
| | | Morocco | (0.10) |
| | | Peru | (0.10) |
| | | Tunisia | (0.04) |
| GROUP 2 | Percentage 0.11 to 0.25 per cent | | |
| | | Bulgaria | (0.18) |
| | | Chile | (0.20) |
| | | Colombia | (0.23) |
| | | Ireland | (0.17) |
| | | Portugal | (0.16) |
| | | Rhodesia | (----) |
| GROUP 3 | Percentage 0.26 to 0.75 per cent | | |
| | | Austria | (0.57) |
| | | Denmark | (0.62) |
| | | Finland | (0.49) |
| | | Greece | (0.29) |
| | | Hungary | (0.52) |
| | | New Zealand | (0.36) |
| | | Norway | (0.43) |
| | | Pakistan | (0.37) |
| | | Romania | (0.36) |
| | | South Africa | (0.52) |
| | | Turkey | (0.35) |
| | | Venezuela | (0.45) |
| | | Yugoslavia | (0.40) |

| | | | |
|---|---|---|---|
| GROUP 4 | Percentage 0.76 to 1.25 per cent | Argentina | (0.93) |
| | | Belgium | (1.10) |
| | | Brazil | (0.89) |
| | | Czechoslovakia | (0.92) |
| | | Mexico | (0.87) |
| | | Netherlands | (1.16) |
| | | Spain | (0.92) |
| | | Sweden | (1.25) |
| | | Switzerland | (0.86) |
| GROUP 5 | Percentage 1.26 to 3.00 per cent | Australia | (1.52) |
| | | India | (1.74) |
| | | Poland | (1.47) |
| GROUP 6 | Percentage 3.01 to 8.00 per cent | Canada | (3.02) |
| | | France | (6.00) |
| | | Germany (Fed.Rep) | (7.01) |
| | | Great Britain | (6.62) |
| | | Italy | (3.34) |
| | | Japan | (3.78) |
| GROUP 7 | Percentage 8.01 to 15.00 per cent | Nil | |
| GROUP 8 | Percentage 15.01 to 35 per cent | USA | (32.02) |
| | | USSR | (17.05) |

Appendix B

| ISSMFE RATING | COST PER MEMBER | |
|---|---|---|
| | (a) $26,000 budget | (b) $20,000 budget |
| 1 | 1.25 | 1.00 |
| 2 | 1.50 | 1.15 |
| 3 | 1.75 | 1.30 |
| 4 | 2.00 | 1.45 |
| 5 | 2.25 | 1.60 |
| 6 | 2.50 | 1.75 |
| 7 | 2.75 | 1.90 |
| 8 | 3.00 | 2.05 |

APPENDIX IV

PROPOSED SCHEME FOR PUBLICITY AND EXCHANGE OF GEOMECHANICS COMPUTER PROGRAMS

(to be organized under the auspices of the ISSMFE)

Submitted by The Australian Geomechanics Society

1. The Secretariat of the ISSMFE would appoint an Institute to act as a central clearinghouse for publicity on programs. (If necessary, CSIRO, Division of Applied Geomechanics, would be prepared to act in this capacity). The modus operandi of the Scheme would be subject to agreement between the Secretariat and the management of the Institute.

2. Scientists and engineers around the world who had developed, tested and fully documented computer programs would be invited to submit them to the Institute together with proforma details regarding the program:

e.g. what it does

input - output arrangements
running costs
forms available (listing, cards, tapes)
charges for making available
name and address of person for further details.

3. The Institute would check that standards of documentation above a defined minimal level were observed by contributors.

4. At least twice a year the Institute would publish booklets containing the accumulated proformas of well-documented programs. The Institute would accept no responsibility for the correctness or accuracy of the programs. Any correspondence stimulated by distribution of the booklets would be addressed to the program originators and not to the Institute. The booklets may also contain discussions on any errors or problems with programs as reported by users or the originators.

5. The booklets would be distributed to the Secretaries of all National Committees and to any individuals or organizations who would subscribe to the ISSMFE amounts calculated to cover the running costs of operating the service. The fact that the service was available could be advertised in the various soil mechanics journals and newsletters around the world.

## APPENDIX V

1. Between the International Society for Soil Mechanics and Foundation Engineering, the International Society for Rock Mechanics and the International Association of Engineering Geology, is created a permanent coordinating secretariat.

2. This permanent coordinating secretariat is governed by a Committee, composed of the Secretaries General of the three societies.

3. The seat of the permanent coordinating secretariat is to be at Brussels. By unanimous decision of the members of the Committee the seat can be transferred to another city.

4. The permanent coortinating secretariat is to be run in such a way that the expenses can be covered by grants and subsidies of Governments, or other national or international bodies.

5. The Committee of the secretariat gathers at least once a year at the seat of the secretariat, and at such other time when two members of the Committee propose a meeting.

6. The Committee has all powers for deciding the use of the funds put at the disposal of the secretariat.

7. The Committee appoints a secretary, for running the daily activities of the secretariat; he assists without voting right at the meetings of the Committee.

8. The secretary of the permanent secretariat will be invited to all meetings of the executive committees of the three societies. He has only an advising role in these meetings.

9. The mission of the permanent coordinating secretariat in its broadest sense is to promote the coordination between the affiliated societies, and to defend their mutual interests. The mission is to be specified in detail by the Committee of the secretariat. Each expansion of the mission has to have the unanimous agreement of all members of the Committee.

10. The official languages of the permanent coordinating secretariat are those of the affiliated societies.

## APPENDIX VI

### VICE PRESIDENT'S REPORT ON NORTH AMERICAN ACTIVITIES

### 1969 - 1973

D. H. MacDonald - Vice President (North America)

1 - GENERAL

The North American geographical zone of the ISSMFE consists of the three countries of Canada, Mexico and the United States of America. Interest in joining the International Society has been exhibited in past years by several other countries in the Caribbean and Central American regions, and specific enquiries have emanated from Panama and the Dominican Republic during the past 4-year period. However, no

specific applications for membership have been forthcoming. Membership figures for the three countries are as follows:

| | January 1, 1968 | January 1, 1972 | Increase or Decrease |
|---|---|---|---|
| Canada | 465 | 542 | + 77 |
| Mexico | 143 | 277 | + 134 |
| U.S.A. | 820 | 734 | - 86 |
| | 1,428 | 1,553 | + 125 |

Numerically, the membership in the zone has grown by 125 in the 4-year period, and the greatest growth has occurred in Mexico.

The highlight of the 4-year period since the Seventh Conference in Mexico City was the holding of the Fourth Panamerican Conference on Soil Mechanics and Foundation Engineering in San Juan, Puerto Rico, from July 14 - 18, 1971. Sponsors of the Conference were: the Soil Mechanics and Foundations Division of the American Society of Civil Engineers (SMFD), the Institute of Engineers, Architects and Surveyors of Puerto Rico, and the Puerto Rico Section of the ASCE. Registration at this Conference was approximately 350. Seven technical sessions covering the fields of standard penetration tests, slope stability in residual soils, allowable settlements, effects of foundation construction on nearby structures, effectiveness of cutoffs in foundations and dams, accuracy of field deformation measurements, and the business and practice of foundation engineering. Thirty-three papers were presented and, together with the state-of-the-art papers, and the panel and other discussions, they constituted a highly successful technical conference. The meeting also included an enjoyable social program which contributed greatly towards making this conference another in the gradually developing series of successful Panamerican Conferences. Previous conferences had been held as follows:

| | | |
|---|---|---|
| First Panamerican Conference | - Mexico City | - September 7 - 12, 1959 |
| Second Panamerican Conference | - São Paulo<br>Rio de Janeirs<br>Belo Horizonte | - July 14 - 24, 1963 |
| Third Panamerican Conference | - Caracas | - July 8 - 15, 1967 |

The Fifth Panamerican Conference will be held in Argentina in 1975.

Other activities in the North American geographical zone are reported below by the three individual countries constituting the zone.

## 2 - CANADA

Canadian National Society
(Associate Committee on Geotechnical Research)

C. B. Crawford, Chairman

W. J. Eden, Secretary
Division of Building Research
National Research Council of Canada
Ottawa, Ontario, K1A OR6

Canadian Geotechnical Society

G. G. Meyerhof, President
Department of Civil Engineering
Nova Scotia Technical College
P.O. Box 1000
Halifax, Nova Scotia.

D. L. Townsend, Secretary
c/o H. Q. Golder & Associates Ltd
3151 Wharton Way
Mississauga, Ontario.

On June 1, 1972, the Canadian Geotechnical Society was formed as a constituent society of the Engineering Institute of Canada, with Dr G. G. Meyerhof as its first President. At the time of formation its membership was approximately 400 and it is expected that this will increase to about 500 within a period of one year. Since the formation of the International Society, and at the present time, the role of national society for Canada has been filled by the Associate Committee on Geotechnical Research of the National Research Council of Canada. Negotiations are, however, currently proceeding so that the newly formed Canadian Geotechnical Society will, within a short time, assume the responsibilities of the national society for Canada.

An important accomplishment in Canada in this 4-year period was the undertaking and completion of a study by a committee of the Science Council of Canada entitled "Earth Sciences Serving the Nation". This study dealt with the solid earth sciences, and one of its recommendations has resulted in the formation of the Canadian Geoscience Council, whose function will be to improve communications amongst all societies in Canada interested in the earth sciences.

Activity in the geotechnical field has continued at a high level during the past 4 years with increasing interest in the many aspects of geotechnical engineering. In recent years interest in problems involving permafrost and northern or cold-climate construction has increased greatly. This is particularly reflected in the number of symposia and conferences held in Canada, and a list of the major geotechnical meetings in the country is shown below.

| Conference | Location | Date | Theme |
|---|---|---|---|
| 1. Conference on Ice Engineering and Avalanche Forecasting and Control | Calgary | Oct. 23-24 1969 | Ice Engineering and Avalanche Forecasting and Control |
| 2. Twenty-second Annual Canadian Geotechnical Conference | Kingston | Dec. 8 - 9 1969 | Geology and Engineering |
| 3. Research Seminar on Soil Dynamics | Montreal | Mar. 12-13 1970 | Soil Dynamics |
| 4. Thirteenth Muskeg Research Conference | Fredericton | May 7 - 8 1970 | Muskeg and Environmental Studies |
| 5. Sixth Canadian Symposium on Rock Mechanics | Montreal | May 28-30 1970 | Evaluation of In-situ Properties of Rock Masses |
| 6. Twenty-third Annual Canadian Conference | Banff | Nov. 19-20 1970 | Geotechnical problems in Transportation |
| 7. Symposium on Stability and Open Pit Mining | Vancouver | Nov. 23-25 1970 | |
| 8. Research Seminar on Construction Problems in Permafrost | Saskatoon | Mar. 11-12 1971 | Construction Problems in Permafrost |
| 9. Joint Meeting of the Seventh Canadian Symposium on Rock Mechanics and the Fourth Tectonics Symposium | Edmonton | Mar. 25-27 1971 | Applications of Structural Geology to Rock Mechanics Problems |
| 10. Seminar on the Permafrost Active Layer | Vancouver | May 4 - 5 1971 | Characteristics of the Active Layer |
| 11. Fourteenth Muskeg Research Conference | Kingston | May 10-11 1971 | Muskeg and the Critical North |
| 12. First Canadian Conference on Earthquake Engineering Research | Vancouver | May 25-26 1971 | |
| 13. Twenty-fourth Annual Canadian Geotechnical Conference | Halifax | Sept. 2-3 1971 | Deep Foundations |
| 14. Canadian Northern Pipeline Research Conference | Ottawa | Feb. 2 - 4 1972 | |
| 15. Research Seminar on Engineering, Evaluation of the Mechanical Properties of Soils | Quebec City | Sept. 28-29 1972 | Evaluation of Mechanical Properties of Soils |
| 16. Symposium on Foundation Problems on Rock | Toronto | Nov. 29 1972 | Foundation Problems on Rock |
| 17. Eighth Canadian Symposium on Rock Mechanics | Toronto | Nov. 30 - Dec. 1 1972 | Tunnelling in Rock |
| 18. Twenty-fifth Annual Canadian Geotechnical Conference | Ottawa | Dec. 7-8 1972 | Foundation Performance |
| 19. National Conference on Urban Engineering Terrain Problems | Montreal | May 7 - 9 1973 | |
| 20. Research Seminar on Analytical Methods in Soil Mechanics | Vancouver | May 10-11 1973 | Analytical Methods in Soil Mechanics |
| 21. Fifteenth Muskeg Research Conference | Edmonton | May 14-15 1973 | Muskeg and the Environment |

Note: Further details on these meetings may be obtained from the Secretary of the Canadian National Society.

In addition to these meetings, several international conferences of considerable interest to geotechnical engineers have been held in Canada.

The International Commission on Large Dams held its Tenth International Congress in Montreal from June 1 to 5, 1970, and much of the technical content of the meeting related to earth and rock-fill dam and foundation problems.

Twelfth Congress of the International Society of Photogrammetry was held in Ottawa between July 23 and August 4, 1972.

From August 21-30, 1972, the Twenty-fourth Session of the International Geological Congress was held in Montreal, and included in the extensive program were sessions on engineering geology.

From July 9-18, 1973, the Twenty-third Congress of the Permanent International Association of Navigational Congresses was held in Ottawa. The ISSMFE was represented at this Conference by Mr C.B. Crawford who will be reporting separately to this Executive Committee Meeting.

The series of Trans Canada Lecture Tours initiated many years ago is still continued on an annual basis by the Associate Committee on Geotechnical Research, in co-operation with various universities and local geotechnical groups. By this means, outstanding lectures by eminent workers in the geotechnical field have been sponsored in many cities throughout Canada.

In 1970, the R.F. Legget Award was estblished in honour of Dr R.F. Legget, a former Vice President for North America of our International Society, on his retirement as Director of the Division of Building Research of the National Research Council of Canada. The award is made for achievements of significance to Canada in the field of geotechnical engineering. Recipients of the award have been:

Robert Peterson (posthumously) in 1970
Robert M. Hardy in 1971
Norman W. McLeod in 1972.

The geotechnical community in Canada continues to be served well by the Canadian Geotechnical Journal which is published quarterly by the National Research Council of Canada and is currently in its 10th year.

## 3 - MEXICO

Mexican National Society
(Sociedad Mexicana de Mecanica
de Suelos A.C.)

Enrique Tamez Gonzalez, President
Facultad de Ingenieria, UNAM
Av. Explanada 1615
Mexico 10, D.F.

Gabriel Garcia Altamirano, Secretary
Sociedad Mexicana de Mecanica de Suelos, A.C.
Apartado Postal 8200
Mexico 1, D.F.

The Mexican Society for Soil Mechanics acts as the National Society for that country. In recent years its membership has grown rapidly and its activities have correspondingly been enlarged. It sponsored the Seventh International Conference of the ISSMFE in Mexico City from August 24-30, 1969. In addition, it sponsors a national meeting at 2-yearly intervals. The Fifth National Conference of Soil Mechanics was held in Mexico City from November 3-4, 1970, and the Sixth such conference was held, also in Mexico City, from November 16-17, 1972.

The highlight of the latter meeting was the first lecture in honour of the memory of Nabor Carillo. These lectures will be at bi-annual intervals and the first one was delivered from November 16-17, 1972, by Dr Arthur Casagrande, a former President of this Society, who chose as his subject "Reflections on Some Unfinished Tasks".

The Mexican Society for Soil Mechanics has been responsible over the years for arranging for the issue of a number of excellent publications on geotechnical work carried out by various agencies in Mexico. In addition, it is now participating in the sponsorship and the publication of "Revista Latinoamericana de Geptecnia" which is published by the Venezuelan National Society of Soil Mechanics and Foundation Engineering and is now in its third year of publication.

## 4 - UNITED STATES OF AMERICA

U.S. National Society
(Executive Committee of the Soil Mechanics
and Foundation Division of the ASCE)

Joseph M. De Salvo, Chairman
91 Roseland Avenue
Caldwell, N.J. 07006

Delon Hampton, Secretary
Department of Civil Engineering
Howard University
Washington, D.C. 20001

In the United States of America the Executive Committee of the Soil Mechanics and Foundations Division of the American Society of Civil Engineers acts as the U.S. National Society of the International Society. However, other organizations such as the Highway Research Board, and the American Society for Testing and Materials (ASTM) are greatly interested in geotechnical engineering and they contribute much through their publications and through sponsorship of meetings.

The Soil Mechanics and Foundations Division (SMFD) of the ASCE is interested and active in sponsoring technical programs at ASCE meetings and seminars and conferences elsewhere, sometimes jointly with other

technical societies. It publishes its Division Journal at regular intervals, and it is active in promoting the collection and publication of technical data in a number of geotechnical areas through the work of its committees.

The U.S. National Society acted as a co-host for the Fourth Panamerican Conference on Soil Mechanics and Foundation Engineering which was held in San Juan, Puerto Rico from June 14-18, 1971, and reported earlier.

Activity in the related fields of rock mechanics and engineering geology has developed to a high level in the last few years, with particular attention being directed to tunnelling, underground and surface excavation, and associated environmental considerations.

Major soil mechanics conferences and seminars in the U.S.A. since the Seventh Conference in August 1969 have been:

| | Conference | Location | Date | Theme |
|---|---|---|---|---|
| 1. | Eighteenth Annual Meeting of the Clay Minerals Society | Fort Worth | Oct. 19-22 1969 | |
| 2. | Twelfth Annual Meeting of the Association of Engineering Geologists | San Francisco | Oct. 21-25 1969 | |
| 3. | Forty-ninth Annual Meeting of the Highway Research Board | Washington | Jan. 12-16 1970 | |
| 4. | Nineteenth Soil Conference of University of Kansas | Lawrence, Kansas | March 13 1970 | Laboratory and Field Tests |
| 5. | Symposium on Soil Compaction - Arizona State University | | Mar. 20-21 1970 | Soil Compaction |
| 6. | Eighteenth Annual Conference on Soil Mechanics and Foundation Engineering of University of Minnesota | Minneapolis | March 26 1970 | |
| 7. | Eighth Annual Symposium on Engineering Geology and Soils Engineering of Idaho State University | Pocatello, Idaho | Apr. 1 - 3 1970 | |
| 8. | State-of-the-Art Conference on the Design and Installation of Pile Foundations and Cellular Structures - Lehigh University | Bethlehem, Pa. | Apr. 13-15 1970 | |
| 9. | Sixth Annual Seminar of Metropolitan Section of ASCE | New York | Apr. 13-14 and May 5 - 6, 1970 | Field observations in Foundation Design and Construction |
| 10. | Fifth Specialty Conference of the SMFD | Ithaca | June 22-24 1970 | Lateral Stresses in the Ground and the Design of Earth Retaining Structures |
| 11. | ASTM Symposium | Toronto | June 26 1970 | Sampling of Soil and Rock |
| 12. | Nineteenth Annual Meeting of the Clay Minerals Society | Miami | Oct. 13-17 1970 | |
| 13. | First Kentucky Soil Mechanics Group Seminar | Lexington | Oct. 16 1970 | Building Foundations, Design and Construction |
| 14. | Thirteenth Annual Meeting of the Association of Engineering Geologists | Washington | Oct. 20-23 1970 | |
| 15. | Twelfth U.S. Symposium on Rock Mechanics | Rollo, Mo. | Nov. 16-18 1970 | |
| 16. | Fifth Conference on Drilling and Rock Mechanics | Austin, Texas | Jan. 5 - 6 1971 | |
| 17. | SMFD-ASCE Symposium | Phoenix, Arizona | Jan. 13-14 1971 | Underground Rock Chambers |
| 18. | Fiftieth Annual Meeting of the Highway Research Board | Washington | Jan. 18-22 1971 | |
| 19. | Earth Systems Inc. Meeting | San Francisco | Feb. 17-20 1971 | Foundations for Systems Building and Modular Housing |
| 20. | Nineteenth Annual Conference on Soil Mechanics and Foundation Engng of University of Minnesota | Minneapolis | March 25 1971 | |

| | Conference | Location | Date | Theme |
|---|---|---|---|---|
| 21. | Ninth Annual Symposium on Engineering Geology and Soils Engineering of Idaho State University | Boise, Idaho | Apr. 5 - 7 1971 | |
| 22. | Twenty-second Annual Highway Geology Symposium | Norman, Oklahoma | Apr. 22-23 1971 | |
| 23. | Seventh Annual Seminar of Metropolitan Section of ASCE | New York | Apr. 26-27 and May 24-25 1971 | Specifications for Foundation and Earthwork Construction |
| 24. | ASTM Symposium on Underwater Soil Sampling, Testing and Construction Control | Atlantic City | June 27 and July 2 1971 | |
| 25. | Engineering Foundation Conference on Owner-Engineer-Contractor Relations in Tunnelling | Deerfield, Mass. | July 12-16 1971 | Owner-Engineer-Contractor Relations in Tunnelling |
| 26. | Twentieth Annual Meeting of the Clay Minerals Society and North American Clay Minerals Conference | Rapid City, S.D. | Aug. 8-12 1971 | |
| 27. | Thirteenth U.S. Symposium on Rock Mechanics | Urbana, Illinois | Aug. 30 and Sept. 1 1971 | Stability of Rock Slopes |
| 28. | Fourteenth Annual Meeting of the Association of Engineering Geologists | Portland, Oregon | Oct. 19-22 1971 | |
| 29. | Fifty-first Annual Meeting of the Highway Research Board | Washington | Jan. 23-26 1972 | |
| 30. | Conference on Rapid Penetration of Terrestrial Materials | College Station, Texas | Feb. 1 - 3 1972 | Rapid Penetration of Terrestrial Materials |
| 31. | Tenth Annual Symposium on Engineering Geology and Soils Engineering of Idaho State University | Moscow, Idaho | Apr. 5 - 7 1972 | |
| 32. | Symposium on Application of the Finite Element Method in Geotechnical Engineering | Vicksburg, Miss. | May 1 - 4 1972 | |
| 33. | ASCE and AIMMPE Conference on Rapid Excavation and Tunnelling | Chicago | June 5 - 7 1972 | |
| 34. | ASCE Conference on Performance of Earth and Earth-Supported Structures | Lafayette, Indiana | June 12-14 1972 | |
| 35. | Fourteenth U.S. Symposium on Rock Mechanics | University Park, Pa. | June 12-14 1972 | New Horizons in Rock Mechanics |
| 36. | ASTM Symposium on Evaluation of Relative Density Test on Cohesionless Soils in the Field and in the Laboratory | Los Angeles | June 25-30 1972 | Evaluation of Relative Density Tests |
| 37. | Twenty-first Annual Meeting of the Clay Minerals Society | Woods Hole, Mass. | Sept. 11-14 1972 | |
| 38. | ASCE Environmental Engineering Meeting - SMFD Session | Houston | Oct. 16-20 1972 | Soil Dynamics |
| 39. | Fifteenth Annual Meeting of the Association of Engineering Geologists | Kansas City | Oct. 24-27 1972 | Underground Storage and Construction |
| 40. | International Conference on Microzonation for Safer Construction | Seattle | Oct. 30-Nov. 3, 1972 | |
| 41. | Second Vanderbilt University Conference on the Application of Finite Element Methods in Civil Engineering | Nashville | Nov. 16-17 1972 | |
| 42. | Sixth Conference on Drilling and Rock Mechanics | Austin | Jan. 22-23 1972 | |

| Conference | Location | Date | Theme |
|---|---|---|---|
| 43. Fifty-second Annual Meeting of the Highway Research Board | Washington | Jan. 22-26 1973 | |
| 44. Twenty-second Annual Soil Mechanics and Foundation Engineering Conference - University of Kansas | Lawrence, Kansas | March 16 1973 | Legal Aspects of Foundation Engineering Practice |
| 45. Twenty-first Annual Soil Mechanics and Foundation Engineering Conference | Minneapolis | March 22 1973 | |
| 46. Eleventh Annual Symposium on Engineering Geology and Soils Engineering | Pocatello, Idaho | Apr. 4 - 6 1973 | |
| 47. Engineering Foundation Conference on use of Shotcrete for Underground Structural Support | South Berwick, Maine | July 15-20 1973 | Shotcrete for Underground Support |

Note: Further details on these meetings may be obtained from the Secretary of the U.S. National Society.

The ASCE through its SMFD has continued the Terzaghi Lectures and the Terzaghi Award, both of which were established in 1963. Terzaghi Lecturers since the Seventh Conference have been:

Stanley D. Wilson in 1969
T. William Lambe in 1970
John Lowe III in 1971, and
Bramlette McClelland in 1972.

Terzaghi Awards in the same period have been made to:

Ralph B Peck in 1969
Laurits Bjerrum in 1971, and
H. Bolton Seed in 1973.

## APPENDIX VII

## AUSTRALASIAN REPORT

## Vice President's Report 1969-73

The major change in the organization of the Australian and New Zealand Societies, the two societies comprising the Australasian Region, that has taken place in the period under review is that both have altered their statutes so that they act as national societies of the International Society for Rock Mechanics as well as the ISSMFE. Recently both societies have also agreed to act as natural societies of the International Association of Engineering Geology. The affiliation with both ISRM and ISSMFE was taken as an opportunity to dispense with the over-lengthy SMFE title and both societies have selected the title Geomechanics although this can be regarded as entirely synonymous with the term Geotechnical as commonly employed in Europe. The suitability of the change in name of course remains with the additional affiliation to the IAEG.

The broadening of the scope of the societies has brought an increase in membership and has encouraged the active participation in the Societies' activities by engineering geologists and experts in rock mechanics, both from the Civil and Mining Engineering sides. The consequent meeting of people with overlapping but not entirely common outlook has proved very stimulating at both conferences and local meetings at which technical papers have been delivered. Particularly is this the case of the Australian Geomechanics Society which is jointly sponsored by the Institution of Engineers of Australia and the Australasian Institute of Mining and Metallurgy. In New Zealand, where mining activity is of lesser importance, the Geomechanics Society, like the previous Soil Mechanics Society, remains under the sole sponsorship of the New Zealand Institution of Engineers but nevertheless, by its broadened scope, has brought a number of engineering geologists into its fold.

Both Societies have found the combining of soil and rock mechanics very successful and fully support current moves of the ISSMFE towards co-ordination with the ISRM and IAEG and perhaps consider it unfortunate that such moves were not made earlier and directed more closely towards amalgamation.

The main joint activity of the two societies of the region are the holding of regional conferences every four years timed to take place half way between International SMFE Conferences. The last was held in Melbourne in 1971 and was rendered even more successful than usual by the attendance of members of the ISSMFE Executive following its meetings in Sydney. The Australian Society took great pleasure in playing host to the Executive and perhaps obtained some of the benefits of hosting an international conference without incurring the long months of hard work associated with such conferences. The next Australian New Zealand Geomechanics Conference will be in July 1975 in Brisbane. Preparations for this conference are well under way.

A supply of cards publicising this conference has been sent to the Organizing Committee for the Moscow Conference for distribution to members of that conference in the hope that even more visitors from overseas than for previous Australasian Regional Conferences, will be encouraged to attend the Brisbane Conference.

Both societies hold evening meetings at which technical papers are presented, such meetings being the responsibility of local groups or branches of the Societies centred on the major cities. The Sydney and Melbourne Groups for example, hold approximately nine such meetings per year. Short conferences and one-day symposia on special topics are also organized both by the local branches and, for the more important ones, by the National Committees. With the inclusion of rock mechanics and mining engineering, the number of such short conferences and symposia has increased in Australia to about four per year.

The New Zealand Society publishes "New Zealand Geomechanics News" which contains articles and précis of technical papers given at meetings of the society together with news of local and overseas activities.

Through the Institution of Engineers of Australia, the Australian Society publishes the Australian Geomechanics Journal. The Society has recently formed an editorial panel for this journal with the aim of maintaining as high a standard of papers as possible. It is hoped that the journal will achieve the same international recognition as journals of some other national societies.

E.H. Davis.

## APPENDIX VIII

## REPORT OF THE VICE-PRESIDENT FOR EUROPE

The Vice-President of a region has to report on the activities of the different national societies of his region during the last four years.

However, during the elapsed period the European Societies have suffered losses of such eminent members that they constitute major, although very sad events in the life of these societies, and therefore the audience will understand that I have to start my report with a duty of pious commemoration of those we have lost.

I have first to evoke the memory of a past president of our society, Dr Laurits Bjerrum, whose sudden death, while he was in full activity, has been a severe shock for all those who knew him personally. It was in London, where he would have attended the Rankine Lecture and also delivered a lecture at Imperial College, that, at the zenith of his life, Dr Bjerrum was taken away from us. He was the beloved disciple of Terzaghi, and in the masterly way he could deliver his lectures, he was the disciple who remembered best all the exceptional qualities of the founder of Soil Mechanics. Also the kindness of his personal contact, and the way he was able to conduct a discussion with the utmost friendliness, without conceding any erroneous deduction or statement, always reminded me of Terzaghi. For the International Society on Soil Mechanics, especially for the European Region and the Norwegian Geotechnical Society, the death of this extraordinary scientist has been a very great loss.

The Norwegian Geotechnical Society has decided the establishment of a Laurits Bjerrum Memorial Foundation. The Foundation's income shall be used to further geotechnical research. We are very thankful to the Norwegian Geotechnical Society for this initiative and for the possibility given to private companies and to the official institutions to contribute by donations to the creation of this Foundation to the memory of Dr Bjerrum.

The Polish National Society regrets the death of one of the pioneers of Soil Mechanics, Professor Pietowski, who attended practically all International Conferences of our Society, including the first one at Harvard in 1936.

With the Russian Society we regret the death of Professor Beresantsev, whose original contributions in our field are known and used the world over.

A short time after the Mexican Conference, the Belgian Society registered the loss of an eminent member, Professor Verdeyen.

Another tragic event during this period of four years was the unexpected death of Professor Roscoe, shortly after he delivered one of the most remarkable Rankine Lectures. He formed the Cambridge School of Soil Mechanics, from which a great many scientists have issued, who now continue the work of Professor Roscoe over the whole world.

Shortly after the European Conference on Soil Mechanics at Madrid, we were informed of the death of Professor Szechy, one of the most eminent scientists of the Hungarian School, which has done so much in the field of Soil Mechanics. The magisterial book of Professor Szechy will remain as a memory of this charming and most eminent personality.

The climax of the activities of a Region is of course its regional conference. The Fifth European Conference on Soil Mechanics and Foundation Engineering was held in Madrid in April 1972. This conference, which was honoured by the presence of the President, Professor Peck, was a real success.

The Spanish Society should be congratulated for the perfect organisation of the Conference, for its high scientific standard, and for the perfect publication of the Proceedings. Unhappily shortly before the Conference the Spanish Society had to announce the death of Professor Escario, chairman of the Organizing Committee, and one of the world-famous scientists in the field of Road Construction. It was very sad that Professor

Escario was not given the opportunity to see the success of his talent for organization. The subject of the European Conference was 'Structures subjected to Lateral Forces' and all aspects of this problem were perfectly covered in the different sessions of the Conference. The topics were:

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|---|---|
| Session I | General theories of earth pressures |
| Session II | Stability of rigid structures |
| Session III | Stability of flexible structures |
| Session IV | Construction problems and case histories. |

The meetings were held in a building which can be considered as a perfect example of what a Congress building should be. The Spanish Organizing Committee, and especially Professor Jimenez Salas, should be thanked for the scientific standing of this Conference.

The now classical Rankine Lectures of the British Society were respectively given by:

the 10th Rankine Lecture in 1970 by the late Professor Roscoe: 'The influence of strains in 'The influence of strains in soil mechanics'.

the 11th Rankine Lecture in 1971 by Professor Jaeger:
'Friction of rocks and the stability of rock slopes'.

the 12th Rankine Lecture in 1972 by Professor Rowe:
'The relevance of soil fabric to soil investigation practice'.

the 13th Rankine Lecture in 1973 by Professor Lambe:
'Predictions in soil engineering'.

All these lectures have been published in the Journal 'Geotechnique'.

In Great Britain there has further been in 1970 a Conference on the behaviour of piles, organized by The Institution of Civil Engineers. While mentioning this conference, it is worthwhile to stress that it is not always easy to prevent a certain overlapping of conferences and subjects, due to the initiative of institutions which are not directly affiliated to our International Society.

In 1973 the British Geotechnical Society organized a symposium on Field Instrumentation.

The German Society "Deutsche Gesellschaft für Erd- und Grundbau" organized its biennial "Baugrundtagungen" in Düsseldorf in 1970, and in Stuttgart in 1972. The reports of these conferences, which were attended by a great many scientists and technicians have been published. The great advantage of the German Baugrundtagungen is that they not only focus attention on theoretical and laboratory problems, but they also pay attention to the practical aspects.

The "Société Française de Mécanique des Sols" organized in May 1972 the "Journées françaises de Mécanique des Sols" about the very important subject 'Comportement des sols avant la rupture - Behaviour of the soil before rupture'. At this conference scientists of practically all French speaking nations were present. It is worthwhile to stress that this conference was honoured by the attendance of Professor Caquet.

In October 1969 the Czechoslovak Committee for Soil Mechanics and Foundation Engineering, organized in Prague a Conference on 'New advances in Soil Mechancss'. Among others a lecture was delivered at that conference by the much lamented Dr Bjerrum 'The young Terzaghi and his way to soil mechanics', and a tribute was paid to the memory of Professor Brinch Hansen.

At that occasion a memorial tablet was unveiled. placed on the house where the founder of Soil Mechanics, Professor Karl Terzaghi, was born.

Among smaller countries, a very active one in the field of Soil Mechanics is Yugoslavia.

In 1969 in Sarajevo an international symposium was organized on 'Civil Engineering Structures resting on soil and rocks'. The contributions to this symposium have been published by the Academy of Sciences and Arts of Bosnia and Hercegovina, Department of Technical Sciences, Sarajevo.

The 12th National Conference of the Yugoslav Society for Soil Mechanics and Foundation Engineering was held in Split in 1971, and the 20th Anniversary of this Society was commemorated in Bled the same year.

Another very active country is Hungary.

In October 1971 there was in Budapest a symposium on moisture measurement, followed by the European Danube Conference on Soil Mechanics and Foundation Engineering, which was a real example of perfect organization and a plain success. The next "Donau-Europäische Konferenz" will be held in Bled (Yugoslavia) in June 1974.

As in many countries there is only one national society covering the fields of Soil Mechanics, Rock Mechanics and Engineering Geology, it is often difficult to determine if the symposia or conferences they organize belong more to the field of our International Society, than to the other two.

The Austrian Society hold Colloquia each year in October in Salzburg. For instance the 19th Colloquium was devoted to the problem of 'Moderne Stollen- und Tunnelbau unter besonderer Berücksichtigung maschinellen Vortriebes'.

The Polish National Society organized in 1970 in Lodz a scientific seminar on 'New Problems in the field of Soil and Rock Mechanics'.

Although I always have to look in the documentation to know if Turkey belongs to the European or Asian Region, it appears, after looking, that it is the duty of the European Vice-President to report that in 1971 was held in Istanbul a Symposium on engineering properties of weathered and jointed rocks. Furthermore on the occasion of the International Conference in Moscow, the Department of Civil Engineering of the Bogaziçi University at Istanbul organizes an International Seminar on Soil Mechanics and Foundation Engineering in the memory of Professor Terzaghi.

The Sweizerische Gesellschaft für Bodenmechanik und Fundationstechnik organized an International Symposium for underground openings in Luzern in September 1972. The annual meeting of this society in 1969 was devoted to the 'Influence of vibrations on foundations and supporting soil'.

The Associazione Geotechnica Italiana had its Conventual Meeting in Milano in 1973.

As always the Scandinavian Societies have been very active. The Swedish National Society organized in 1969 several symposia, namely, one on soil sampling, also in 1969, and one on morains (Morän).

The Scandinavian Geotechnical Meeting was held in Trondheim (Norway) in August 1972 and was organized by the Norwegian Geotechnical Society.

In connexion with the Moscow Conference the Swedish National Society organized a Symposium on Soil Structure on the 1st and 2nd August 1973.

In principle the initiatives of the National Societies, which are intended to have a more than national audience, should be brought to the attention of the regional vice-president and get his approval. However, this is not always easy as the initiatives are not always taken by the affiliated national societies, but often by other bodies (Academies, Universities, other Societies). In order to obtain a better organization it is strongly recommended that members who know of a given initiative should inform in good time the regional vice-president.

Of course the vice-president can only report the activities which are brought to his attention by the national societies involved. I am quite aware that several other activities other than those mentioned in this report have been taken by the societies. The Secretary General has drawn to the attention of the secretaries of the National Societies that they should send a report of the activities to their regional Vice-President. However, few societies have followed the suggestion of the Secretary General.

Besides special initiatives, the national societies have held local meetings and organized special lectures. It is however impossible to enter into such details.

Although until yet in Rumania does not exist a national society on Soil Mechanics and Foundation Engineering affiliated to our International Society, I received an invitation for the 2nd Conference on Soil Mechanics and Foundation Engineering, organized in Bucaresti in 1972, by the National Council of Engineers. This Conference was devoted to 'Foundation problems in special soil conditions'. It was to be regretted that Rumania, a country in which outstanding work is done in the field of soil mechanics, was not affiliated to our national society. However during the month of July I was advised that Rumania has submitted its application to be a member of the International Society on Soil Mechanics and Foundation Engineering.

The Komitee für Bodenmechanik und Grundbau in der Deutschen Demokratischen Republik has submitted in due course an application to become a member of our International Society. It has already organized in Dresden in November 1972 an international symposium concerning 'Sohldruckverteilung unter Flachengründungen bei besonderer Berücksichtigung der Bauwerksteifigkeit' - 'Distribution of soil reactions underneath foundation rafts, with special consideration of the rigidity of the building'.

With acceptance of this application, the number of affiliated Societies belonging to the European region will increase from 23 to 24; this is more than half the total number of societies all over the world.

With the approval of the regional vice-president, the Swedish National Society will hold in June 1974 at Stockholm a European Symposium on Penetration Testing, and the British Geotechnical Society will hold a conference in Cambridge from 2nd to 4th April 1974 on the problem of the settlement of structures.

Of course, the European Region is very proud that the U.S.S.R. National Society has accepted to organize the 8th International Conference on Soil Mechanics and Foundation Engineering. The Russian Society has done a tremendous work in preparing this conference. As however, the Conference is not a regional but an international event, the only duty of the vice-president is to mention this initiative taken by the Russian Society.

The VIth European Conference on Soil Mechanics and Foundation Engineering will be organized by the Austrian Society of Soil Mechanics and Foundation Engineering, backed by the Austrian Association of Engineers and Architects. It will be held in Vienna in March 1976, on the occasion of the 50th anniversary of the publication of the book of Professor Terzaghi 'Erdbaumechanik auf Bodenphysikalischer Grundlage'. The theme of the Conference will be 'Deep foundations and deep excavations'. Topics of the sessions will be:

Session 1: Deep excavations: Stability of temporary and permanent slopes - Dewatering problem-slurry walls, walls with secant piles - bracing; freezing technique.

Session 2: Deep foundations: Tunnelling.

Session 3: Deep foundations in open pits - Pile foundations - Caisson foundations.

During the past four years the opportunity was offered to me to tighten my personal contacts with many national societies and distinguished colleagues. I always appreciated the spirit of friendship and cordiality

which exists between the members of our International Society, not only between the older ones who still remember the time of the foundation of our Society by Professor Terzaghi, but also between the younger members.

Prof. Dr ir E. DE BEER.

## APPENDIX IX

## REPORT OF THE VICE-PRESIDENT FOR AFRICA

M. Pimentel dos Santos

The main event during the period was the 5th Regional Conference for Africa on Soil Mechanics and Foundation Engineering. The meeting was held in Luanda, Angola from the 23rd to the 28th August 1971 and was followed by an excursion from 29th August to September 4th.

A short review of the relevant aspects of the Conference is attached.

The activities of the National Societies of Morocco, Republic of South Africa and Rhodesia are object of short reports also attached.

During the period Ghana has organized his National Society.

In what concerns both Angola and Mozambique, the most relevant activities were based upon the Civil Engineering Laboratories of Luanda and Lourenço Marques in which a number of lectures and technical courses had been carried out. As it is known, members of the International Society resident in those territories are member of regional groups of the National Portuguese Society.

### 5th REGIONAL CONFERENCE FOR AFRICA ON SOIL MECHANICS AND FOUNDATION ENGINEERING

1 - Venue and date of the Conference

The 5th Regional Conference for Africa on Soil Mechanics and Foundation Engineering took place in Luanda, Angola (Portuguese West Africa), at the Laboratório de Engenharia de Angola from the 23rd to the 28th August 1971.

The presentation and discussion of papers filled 15 working sessions, two sessions per morning and two per afternoon.

2 - Participants

89 national and foreign delegates participated in the Conference, with 33 persons accompanying. From South Africa there were 41, of whom 7 were accompanying; Australia 3, one accompanying; Brasil 4, 2 accompanying; U.S.A. 2, one accompanying; England 1; Portugal 58, 21 of whom accompanying; Malawi 1; Ghana, Tanzania and Jamaica had announced their intention of attending and enroled, however at the last moment their delegates were prevented from coming to Angola for personal or professional reasons. However Ghana took part with three papers.

3 - Opening the Conference

The opening session was presided over by his Excellency, the Minister of Overseas Territories, Professor Dr. Joaquim Moreira da Silva Cunha, attended by his Excellency the Governor General of Angola, several Provincial Secretaries, the Director General of Public Works and Communications and the Chairman of the 5th Conference Engineer Henrique Novais-Ferreira.

4 - Themes Papers and Respective Discussions

4.1 - The work of the Conference occupied five days, comprising 15 working sessions, 2 per morning and 2 per afternoon.

The Conference was organized so as to cover geotechnical problems of outstanding importance which were grouped into 5 themes namely:

Theme 1 - Tropical and sub-tropical unstable soils
Theme 2 - Tropical and sub-tropical concretionary
Theme 3 - Stresses deformation of soils foundation
Theme 4 - Earthworks
Theme 5 - Road and slope erosion calculation of same

4.1.1 - Tropical and sub-tropical unstable soils

8 papers* were submitted for this theme, 4 from South Africa, 3 from Portugal and 1 from the U.S.A. The papers dealt with problems relative to the identification of expansive soils and evaluation of their behaviour, origin of cracking caused by the volumetric unstability, and correlation between geological

* - vide index of papers.

characteristics and geotechnical properties.

The General Reporter was W.R. Mackechnie from Rhodesia, the panel comprised Van der Marwe, Rhodesia, K. Knight, South Africa, J.A. Horta da Silva, Portugal, Milton Vargas, Brasil and A.A.B. Williams, South Africa. The sessions were chaired by L.C. Wilson of South Africa, J.M.F. Meireles of Portugal and B.A. Kantey of South Africa.

Apart from panel members, contributors to the discussions were made by Aitchison of Australia, B.A. Kantey, G.W. Donaldson, L.Webb, L.C. Wilson, R. Maud and A.A. Williams of South Africa, and B. Martins and Novais-Ferreira of Portugal.

In view of the discussion, it was considered to be relevant to progress in this particular field, to know the orientation of soil cracking and diaclase. Aitchison drew attention to the need for future investigation to be directed towards the mechanics of cracked media and not of continuous media.

There was considerable discussion of the problems included in the double-oedometer test, concluding that this test, evolved years ago by Knight continues of practical value, but much less for investigation. Knight, Kantey, Barreiros Martins, Webb, etc., took part in this debate. The difficulty in reproducing the range of stress in the laboratory, plus the fact of the expansion or the collapsing settlement being done under complete soaking imposes certain limitations.

The question of subdividing the pore pressure into various components was only raised by Horta da Silva, despite the General Reporter having raised it as of great importance for future investigation. Moreover control of suction throughout the oedometer test seems a sine qua non for progress in the study of unstable soil behaviour.

With an easy identification of expansive soils in mind by their plasticity index and clay percentage in accordance with the graph published by Van der Merwe in 1964, and taking into account the problem of the occurrence of expansive soils with activity < 0·5 as discussed by Wilson, Horta da Silva proposed the use of the ultimate activity concept. In this new approach IP is determined from values for $w_L$ and $w_P$, both determined with the dispersive aqueous solution used to determine the clay percentage.

4.1.2 - Tropical and sub-tropical concretionary soils

Nine papers* were submitted for this theme, one from South Africa, two from Ghana, four from Portugal, one from Rhodesia and one from the U.S.A.

The papers concerned with matters that relate to geological characteristics of concretionary soils, their fundamental geotechnical properties and their use as construction materials and foundation substratum.

The General Reporter was Mountain from South Africa, with panel members F. Hugo and R.R. Maud, South Africa, J.M.F. Meireles from Portugal, C.P. van der Merwe, Rhodesia and B.S. Persons, U.S.A. The sessions were chaired by Novais-Ferreira and A. Rosinha, Portugal, and for H.G. Geed, Rhodesia.

Apart from the panel members, the following contributed to the discussion: B. Watt, J. Gregg, Burgers, P.A. Lendin, K. Knight, South Africa, P.G. Wilson, Australia, Milton Vargas, Brasil, and Novais-Ferreira, Portugal.

In view of the controversy arising from the terminology used by different delegates, the General Reporter commented on this, especially concerning ferruginous concretionary soils other soils discussed were silicious and calcarious concretionary soils, Mountain calling attention to the behaviour of gypsoferous soils in roads, which in his opinion formed a fourth type of concretionary soils. The problem of auto-stabilization of concretionary soils was a further point of discussion.

During the debate contributions centred largely on the terminology problem giving rise to even more confusion. In face of this confusion, Burgers idea of the creation of a committee for various participating countries to standardise nomenclature, was aposite.

Due to the General Reporters' inability to attend the closing session this was chaired by Knight, who agreed that he himself found that the controversy supported Burgers suggestion, and that confusion seemed to spread to auto-stabilization as well.

4.1.3 - Stresses and deformation in soils. Foundations

Seven papers* were submitted one from Portugal, four from South Africa, one from Thailand and one combined paper Swedish-American.

The papers dealt with problems relating to the clay percentage and shear strength, effects of the stress path and of the overconsolidation ratio on the shear strength by vane tests, consolidation characteristics of altered tropical clays; foundations on expansive clays and elastic plastic and visco-elastic behaviour of foundations.

The General Reporter was A. Barreiros Martins, Portugal, and panel members were Aitchison, Australia, Novais-Ferreira, Portugal, Webb and Hugo, South Africa, and Milton Vargas, Brasil. The session were chaired by Pimentel dos Santos and J.C. Boavida, Portugal, and Mohamed, Malawi.

Apart from the panel members G.W. Donaldson, B. Watt, MacRobertson, L.C. Wilson, H. Weber, and O.K. Steffer from South Africa, E. Brand from Thailand, and A.M. Falcão, Portugal, contributed to the discussions.

*. - Vide index of papers

In view of the nature of the papers and the current state of the art, it was felt aposite to discuss problems of stress coefficients in soil, their measurement and use in planning foundations, numerical methods for evaluating stress and deformation in foundation soils, non elastic and non-linear elastic properties of african soils, structural characteristics of sub-bases and pavements, buried and surface foundations, load-bearing capacity and the correlation between calculated and actual results by observation of the ground.

Aitchison contribution bears mention as to methodology in the study of characteristics and tensile-deformation states in soils, and Watt's mention of the intricate problems with residual soils as well as of the limited value in geotechnical parametres such as plasticity, activity, consolidation, etc., in the light of classical soil mechanics. There was diverse and intense controversy over the latter point. As well as these matters, which took up most of the sessions, it should be mentioned that Webb presented a simples method for calculating subsidence inside embankments, and Donaldson dealt with friction in piles.

4.1.4 - Earth works

Only three papers* were received on this theme, one from Brasil, one from the U.S.A. and one from South Africa, and only three sessions were given to it.

The papers dealt with survey of cracked slopes stability design of embankments in tropical countries and geotechnical properties of residual soils originated by alteration of basalts.

The General Reporter was A. Burgers of South Africa, with panel comprising G.W. Donaldson, D.J. Watt and K. Knight, South Africa, W. Mackechnie, Rhodesia, and J.A. Horta da Silva, Portugal. The sessions were chaired by Milton Vargas, Brasil, and J.S. Gregg, South Africa.

There was discussion by Mac Robertson, K. Steffen, B.A. Kantey, A. van Schalkwyk, L.C. Wilson, from South Africa, E.W. Brand, Thailand, Aitchison and P.G. Wilson, Australia, Milton Vargas and C. Nieble, Brasil, and A. Woods, Rhodesia, as well as from panel members.

Each session covered a discrete theme, namely stability of slopes and small earth dams. For the former the General Reporter proposed discussion of various problems related to simplified calculation of road-slopes embankments and gradients, and recognition of soils liable to strength degradation through problems of site-geology, compaction of earth-works, stability, and alterability, of rock-fills were discussed.

The General Reporter wound up by saying that he thought there had been insufficient time to discuss two so important themes in one. Watt gave an interesting summary of the present level of knowledge on analytical methods based on work by Muller, Hook, Jennings, etc., and including the problem of discontinuous media.

Robertson dealt with problems of geological discontinuities, stressing that before choosing an adequate analytical method, one must interpret the geological and geomorphological factors deemed important for each case, and define the ground's most probable slip-potential surface. Nieble discussed the problem of alterability of rocks, which is considered to be a subject of great importance. In earth-dams, the case being smaller ones only, Aitchison, Williams and Wood mentioned problems of cation-exchange in certain soils, tests for rate of sodium absorption and for cases of failure due to deflocculation of compacted soils caused by varying electrolitic concentration, a problem already touched on by Horta da Silva.

4.1.5 - Road and slope - erosion

Ten papers* were received on this theme, three from South Africa, one from Brasil, two from Ghana, two from Portugal, one from Rhodesia and one British-South Africa papers, which totalled three sessions.

The studies presented dealt with matters relating to stabilization of soils with lime and cement, influence of climatic conditions on the design of pavements, the use of cells for measuring stresses in roads, strength of bases for flexible pavements, behaviour of pavements and correlation between the clay percentage, CBR and density.

The General Reporter was Pimentel dos Santos, Portugal, and the panel was J.S. Gregg, R.A. Smith, and H. Todres, South Africa; R.W. Mackechnie, Rhodesia; J.M.F. Meireles, Portugal. The sessions were chaired by G. Sharp, Rhodesia, K. Knight, South Africa, and M. Falcão, Portugal.

From the floor, H.K. Gell, C.P. Van der Merwe, Rhodesia; A.B. Williams, K.A. Clauss, F. Hugo and P.A. Loudon, South Africa; Novais-Ferreira and Carlos Silva, Portugal; Aitchison, Australia; Milton Vargas, Brasil; and M.S.F. Brown U.K., also contributed to the discussion.

Based on the nature of the papers, the General Reporter suggested related problems of lime stabilization and of erosion, for discussion.

There was discussion by J.M.F. Meireles, Carlos Silva, Novais-Ferreira and Milton Vargas on the erosion problem, dealing with particular cases in Angola and Brasil. Aitchison dealt with the influence of climatic conditions on soil prospecting and pavement calculation including a generalized comparative term, soil suction.

The remaining discussion covered aspects of design and performance of pavements, not going specifically into lime stabilization except in the case of short reference by Loudon. Williams stressed compaction problems, especially with collapsing soils, and the use of pressure-cells in determining soil stresses. Novais-Ferreira dealt with aspects of the use statistics in soil mechanics.

* - Vide index of papers

5 - Conclusions of the 5th Conference.
Norms for drawing up general reports

Work finished on August 28th 1971. The closing session was chaired by Eng. Manuel Pimentel dos Santos, aided by Engrs. Kantey, Mackechnie, and Novais-Ferreira.

Eng°. Novais-Ferreira spoke first as chairman of the organising committee, giving delegates the conclusions of the ad hoc committee, as follows:

1) - nomination of new vice-chairman for Africa - that the nomination be made at the next International Conference de Soil Mechanics in Moscow, 1973, Dr. Graft-Johnson of Ghana was proposed, the national society of that country having been recently admitted;

2) - venue of the next Regional Conference - after discussion the South Africa National Society for Soil Mechanics and Foundation Engineering undertook to organise the next Regional Conference, and to choose time and place as soon as possible;

3) - vocabulary for laterites - Eng.° Burgers proposed the setting up of a study group to draw up vocabulary for laterites, lateritic soils and ferralitic soils. The delegates agreed with this.

6 - Post-Conference Excursion

Upon closure of the Conference work, some delegates and their companions took part in an excursion from August 29th to September 4th, 1971. Visits were made to see roads on lateritic soils in the Quibala-Cela-Nova Lisboa area, roads on expansive soils at Catete, Benguela, Novo Redondo, and foundations in expansive soils.

Visits were also made to a concrete dam (Cambambe) and an earth dam (Gove), the latter in the Nova Lisboa area.

## Annex - Index of papers

Tropical and Subtropical unstable soils

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| R.R. Maud D.L. Webb South Africa | The Occurrence and Engineering Properties of Expansive Soils in Natal, South Africa, pp 1-3 |
| H.A. Todres K.A. Clauss South Africa | Particle Size Analysis of Clay-Containing Soils pp.1-9 |
| G.E. Blight A.A.B.Williams South Africa | Cracks and Fissures by Shrinkage and Swelling, pp.1-15 |
| I.J.A.Brackley, South Africa | Partial Collapse in Unsaturated Expansive Clay, pp.1-23 |
| J.A. Horta da Silva, Portugal | Geology and Engineering Behaviour of Expansive Clay from Cazenga Region-Luanda, pp.1-31 |
| J.A. Horta da Silva, Portugal | Relationships between the collapsing soils of the Luanda and Luso Regions, pp.1-41 |
| W.J. Morin, U.S.A. | Properties of African Tropical Black Clay Soils, pp.1-51 |
| M.J. Azevedo Macedo, Portugal | Contribution for the Study of the Red Soils of the City of Lourenco Marques, pp.1-61 |

Tropical and subtropical concretionary soils

| | |
|---|---|
| R.R. Maud, South Africa | The Occurrence and Properties of Ferricretes in Natal, South Africa, pp.2-3 |
| C.P.Van der Merwe, Rhodesia | The Properties and Use of Laterites in Rhodesia, pp.2-7 |
| G. Soares de Carvalho, Portugal | Geology of Materials Used in Highways Construction that run Through the Planations Surfaces of the South of Angola, pp.2-17 |
| B.S. Persons, U.S.A. | Evaluating the Characteristics of Marine Non-Clastics to Support Heavy Foundations, pp.2-23 |
| J.M. Ferreira Meireles, Portugal | Mechanical Effect on Geotechnical Properties of Lateritic Soils, pp.2-33 |
| A.M.da Costa Antunes, Portugal | Iron and Clay Content and the Geotechnical Identification of Laterites, pp.2-37 |
| W.J. Morin, U.S.A. and J. Ayetey, Ghana | Formation and Properties of Red Tropical Soils, pp.2-45 |
| M.D. Gidigasu, H.S. Bhatia, Ghana | The Importance of Soil Profiles to the Engineering Studies of Laterite Soils in Ghana, pp.2-55 |
| J.A.P. Gomes Teixeira, Portugal | Lateritic Soils of the Cela Region-Mineralogy and Geotechnical Classification, pp.2-61. |

Stresses and Strains in Soils Foundations

| | |
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| H. Novais-Ferreira, Portugal | The Clay Content and the Shear Strength in Sand Clay Mixtures, pp3-3 |
| P.C.Curtayne, H.A.Todres, South Africa | Investigation and Correlation of Parameters Determining Structural Properties of Subgrades, pp.3-11. |
| Robert D.Holtz, Sweden and Raymond J. Krizek, U.S.A. | Effects of Stress Path and Overconsolidation Ratio on the Shear Strength of a Kaolin Clay, pp.3-17 |
| G.E. Blight, South Africa | Can in Situ Stress Ratios be Estimated by Means of the Vane Shear Test, pp3-27 |

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| G.W. Donaldson, South Africa | Foundations for a Pipeline over Expansive Soil, pp.3-33 |
| Brian J. Watt, South Africa | Elastic, Elastoplastic and Viscoelastic Behaviour in Foundations, pp.3-43 |
| Edward W. Brand, Surinda Kanjanophas, Thailand | The Consolidation Characteristics of Weathered Tropical Clay, pp.3-51 |

Earthworks

| | |
|---|---|
| A. Mac G. Robertson, South Africa | Accounting for Cracks in Slope Stability Analysis, pp.4-3 |
| E.S. Smith, U.S.A. | Embankment Design Experience in Tropical Countries, pp.4-11 |
| Paulo T. Cruz, Carlos M. Nieble, Brasil | Engineering Properties of Residual Soils and Granular Materials Originated from Basalts-Capivara Dam-Brasil, pp.4-19 |

Roads and Slope Erosion. Design, Strengthening and observation of road pavements. Effects of climate.

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| J.W. Vail, South Africa | Soil Stabilization Reactions with Dolomitic Lime, pp.5-3 |
| J.de Medina, Brasil | Some Considerations on Climatic Factors in Pavement Design, pp.5-9 |
| A.A.B. Williams, South Africa and S.F. Brown, Great Britain | The use of earth pressure cells in some road experiments, pp.5-15 |
| M.van Rooyen, South Africa | The effect of a foaming agent on the compaction properties of a sandy soil, pp.5-23 |
| R.L. Mitchell, Rhodesia | The strength of bases for flexible pavements, with reference to Overlays, pp.5-29 |
| H.Novais-Ferreira, Portugal | Clay content in soil and the correlation between CBR and density, pp.5-35. |
| R.A.L.M. Santareno, Portugal | Cement content in soil-cement. Correlation of values determined by wear and failure criteria, pp.5-43 |
| P.C. Todor, U.S.A., and S.L.Yeboa, Ghana | Pavement deflection and performance in Ghana, pp.5-49 |
| R.S. Levinson, U.S.A. and A.K.Castel, Ghana | Stabilization of three lateritic gravels from Ghana, pp.5-55 |
| K.A. Clauss, P.A. Loudon, South Africa | The influence of initial consumption of lime on the stabilization of South African Road materials, pp.5-61. |

## RAPPORT SUR LES ACTIVITES DU COMITE MAROCAIN DE MECANIQUE DES SOLS ET DES ROCHES DEPUIS 1969

Depuis 1969, les activités du COMITE MAROCAIN DE MECANIQUE DES SOLS ET DES ROCHES ont été réparties sur:

1/L'organisation de conférences techniques
2/L'organisation de visites géotechniques sur des sites de grands chantiers du Maroc.
3/La préparation de communications du Maroc pour diverses manifestations internationales de mécanique des sols
4/L'examen de propositions de sujets de recherche appliquée intéressant la mécanique des sols.

1 - ORGANISATION DE CONFERENCES

Le Jeudi 23 Octobre 1959 sous la présidence de Monsieur CHAMI, Directeur de l'Hydraulique, a eu lieu à CASABLANCA, une conférence présentée par Monsieur SABARLY, Président Directeur Général de la Société Géoconseil, sur:

"Les conceptions modernes de l'étanchéité et du drainage dans les projets de barrage"

Le 16 Decembre 1969 sous la présidence de Monsieur KANOUNI, Chef du Service de la Voie et des Ouvrages D'Art à L'Office National des Chemins de Fer, Monsieur VIDAL a fait à CASABLANCA une conférence agrémentée d'un film sur:

"La terre armée"
(Conception et possibilités offertes dans le génie civil)

Le Mardi 13 Janvier 1970 sous la présidence de Monsieur GHISSASSI Secrétaire Général du Ministère des Travaux Publics, Monsieur BERRADA, Directeur de l'Administration des Eaux et Forêts a fait une conférence dans l'amphithéâtre de l'Institut Agronomique Hassan II à RABAT sur:

"Les procédés de lutte contre différentes formes d'érosion dans diverses régions du Maroc"

Le 13 Juin 1970 une conférence sur le gonflement des sols argileux a été présentée par Monsieur MARIOTTI à SAFI à l'issue de la visite géotechnique de cette ville.

Le 10 Décembre 1970 conférence à RABAT à l'Institut Agronomique de Monsieur BACHELEZ, Directeur de l'Equipement à l'Aéroport de PARIS, sur le thème:

"Construction de l'aéroport de ROISSY-EN-FRANCE - problèmes de mécanique des sols et de géotechnique routières"

Conférence placée sous la présidence effective de Monsieur GHISSASSI, Secrétaire Général du Ministère des Travaux Publics.

Le 26 Janvier 1971, conférence à CASABLANCA de Monsieur BIAREZ, Professeur de Mécanique des Sols à la Faculté des Sciences de GRENOBLE, sur le thème:

"Réflexions sur quelques exemples de glissement de terrain et d'accidents de fondation d'ouvrages"

Conférence placée sous la présidence de Monsieur BEL HADJ, Ingénieur en Chef des Ponts et Chaussées, Chef de la Circonscription du Nord des Travaux Publics et Président du C.M.M.S.R.

Le 29 Avril 1971, conférence à CASABLANCA de Monsieur COMES, Ingénieur chargé des études géotechniques à la Direction de l'Equipement de l'Electricité de France, sur:

"Etude géotechnique et géologique des grandes centrales souterraines'

Conférence placée sous la présidence de Monsieur DOUIEB, Directeur de la Géologie au Ministère du Commerce, de l'Industrie et des Mines.

Le 17 Mai 1972, à l'hôtel de la Tour Hassan à RABAT, Monsieur MARCHAND, Directeur au Maroc du Bureau d'Etudes Coynes et Bellier, a présenté une conférence sur:

"La philosophie du traitement des fondations de barrage à l'appui de quelques exemples et à l'appui notamment de l'example du barrage des AIT AADEL"

Le 11 Janvier 1973, conférence à CASABLANCA de Monsieur LEHUEROU KERISEL, Président Directeur Général du Bureau d'Etudes Simecsol, sur le thème:

"Etat actuel des connaissances de la mécanique des sols - lacunes et progrés"

Conférence placée sous la présidence de Monsieur BEL HADJ, Secrétaire Général du Ministère des Travaux Publics.

II - ORGANISATION DE VISITES GEOTECHNIQUES

a) Au cours de l'année1969 a été organisée une visite du chantier du barrage en terre des AIT AADEL sur l'oued Tessaout. Au cours de cette visite ont été exposés notamment tous les problèmes posés par la fondation de cet ouvrage et par la sélection et la mise en place des matériaux du corps du barrage. Rappelons que ce barrage est constitué par un noyau central à axe vertical en limons argileux doléritiques; les recharges latérales à l'amont et à l'aval sont constituées d'alluvions grossières.

A l'occasion des essais de mécanique des sols entrepris pour définir les qualités mécaniques des limons du noyau imperméable un programme de recherches a été entamé sur le thème:

"Estimation et dissipation des pressions interstitielles dans les limons compactés au cours de la construction du barrage"

b) Au cours de la même année 1969 a été organisée une visite géotechnique de la ville de SAFI; des problèmes de fondation se posent dans cette ville où le sol est constitué sur une forte épaisseur par des marnes surconsolidées expansives qui sont le siège de gonflements importants.

c) Au cours du mois de Décembre 1970 a eu lieu une visite géotechnique sur le chantier de la nouvelle piste d'envol de l'aérodrome de TANGER; au cours de cette visite un exposé a été fait par Monsieur MARIOTTI sur le comportement des "tirs" marocains (sols assimilables aux black cotton soils).

d) Le 31 Mars et le 1er Avril 1971 ont été organisées des visites des deux grands chantiers de barrages du Sud (barrage en béton de MANSOUR EDDHABI sur l'oued Drâa et barrage en terre de YOUSSEF BEN TACHFINE sur l'oued Massa prés d'AGADIR).

III -

Notre comité national a d'autre part participé à diverses manifestations internationales (colloques, symposia et congrés) au cours desquelles il a presenté less communications suivantes:

a) "Le processus d'essais d'altération des roches tendres sous étreinte contrôlée - critères d'altérabilité'

par Messieurs CHAOUI, MARIOTTI et ORLIAC, communication présentée au colloque géotechnique de TOULOUSE en 1969.

b) "La construction du barrage en terre du Grou sur les terrasses fluviatiles quaternaires récentes"

par Messieurs BENISTY et TONNON, communication présentée au congrès de MONTREAL les 29 et 30 Mai 1970.

c) "Caractéristiques de déformabilité et de résistance au cisaillement de marnes indurées par mesures in-situ"

par Messieurs CHAOUI, MARIOTTI et ORLIAC, communication présentée au congrès de BELGRADE du 21 au 26 Septembre 1970.

d) Notre comité a également préparé une série de cinq communications géotechniques à la Deuxième Conférence Routière Africaine.

IV -

Notre comité national a enfin examiné la sélection de programmes d'études à caractère de recherches dont les sujets sont les suivants:

a) Fondations sur sols de faible portance:
Etude de l'efficacité de couches granulaires confinées par des armatures métalliques (principe de la terre armée) pour la diffusion des contraintes en profondeur.

b) Fondations sur sols surconsolides expansifs:
Contrôle de la répartition réelle des réactions du sol sous les semelles d'un bâtiment reposant sur sols expansifs au cours du développement du potentiel de gonflement.
Caractéristiques mécaniques et coefficient de sécurité à adopter vis-à-vis des réactions résultant de la libération du potentiel de gonflement.
Contrôle expérimental des forces de traction développées dans le fût de fondations sur pieux traversant des couches expansives; efficacité des moyens pour les supprimer.

c) Fondations de ponts:
Etude de la profondeur des affouillements dans les lits de rivière intervenant pendant les crues.

d) Etude générale des phénomènes d'érosion de la Zone Nord et étude de la stabilité des pentes dans les formations argiloschisteuses de cette région.

## REPORT ON THE ACTIVITIES OF THE SOUTH AFRICAN NATIONAL SOCIETY FOR THE PERIOD JULY 1971 - JULY 1973

| | |
|---|---|
| *COUNTRY* | Republic of South Africa |
| *NAME OF THE SOCIETY* | Division of Soil Mechanics and Foundation Engineering of the South African Institution of Civil Engineers |
| *NUMBER OF MEMBERS* | Approximately 420 |

### CONFERENCES

The 5th Regional Conference for Africa on Soil Mechanics and Foundation Engineering held in Luanda in August 1971 was attended by 33 South African delegates who submitted 14 papers.

The 6th Regional Conference for Africa on Soil Mechanics and Foundation Engineering is being organised by the South African National Society and is planned to be held in Durban in September 1975.

### SPECIAL ACTIVITIES

Prof. V. de Mello of Brazil gave an address on "A State-of-the-art on the Standard Penetration Test" in July 1971.
A Colloquium on "Design of High Road Fills" was held in June 1972.
A Workshop Session on "Urban geotechnical data banking" was held in February 1973.
A Course on "Stability of rock slopes" was held in February 1973.
Dr. J.L. Sherard of USA gave an address on "Some problems in earth dams" in April 1973.

### PUBLICATION

Members of the Society participated in the drawing up of a Code of Practice for "Lateral support of surface excavations".

## REPORT FROM RHODESIA 1969-1973

The Rhodesian National Society is the Geotechnical Division of the Rhodesian Institution of Engineers non-members of the Institution being admitted to the Society as Participants.

The Division's membership has slowly increased during the period, the number now being about 220 Engineers, Scientists, Technicians and Participants. However, possibly only 10% of this number are actively practising in the Soil Mechanics field, the remainder having only a passing interest.

Some 30 evening meetings have been held in Salisbury, with occasional repeat lectures in other cities. Half of the meetings have been formal and the lectures published in 'The Rhodesian Engineer'. Report-backs have been given on international conferences in the field.

Most lectures have been given by members, with possibly 30% by visiting specialists (mostly on the highway aspects of Soil Mechanics and Geotechnology).

Due to the small numbers of practitioners, local symposia have not been convened. Considerable support was given to the Fourth Regional Conference in Angola, and a contribution was made to the Haifa Conference on Expansive Soils. It is regretted that the lack of visas prevented our representation at the Moscow Conference.

## APPENDIX X

## REPORT ON ACTIVITIES IN SOUTH AMERICA IN THE PERIOD 1969-1973. G. PEREZ-GUERRA, VICE-PRESIDENT, S. AMERICA

Several important events took place in the region of the Vice-Presidency, namely:

1 - Fourth Pan-American Conference held in San Juan de Puerto Rico in 1971.

2 - Founding and establishment of the Latin-American Geotechnical Magazine in 1971.

3 - Organization and admission into the International Society of the Chile National Society in 1971.

4 - Second Peru National Conference in 1970.

5 - Fourth Brasil National Conference in 1970.

6 - Second Argentina National Conference in 1970.

7 - Venezuela Lecture Series in 1972.

### 1 - FOURTH PAN-AMERICAN CONFERENCE

Pan-American Conferences are realized every four years, in between the years of the International Conferences. The first was held in Mexico City in 1959, the second in Brasil (Rio de Janeiro, Sao Paulo, Belo Horizonte) in 1963 and the third in Caracas in 1967. Puerto Rico was elected as the seat of the fourth, it being organized as a joint effort of the Soil Mechanics and Foundation Division of the American Society of Civil Engineers, the Puerto Rico Chapter of the ASCE and the Institute of Engineers, Architects and Surveyors of Puerto Rico.

The Conference was held June 14-18 1971, at the Hotel San Juan in San Juan de Puerto Rico. It was attended by 350 registrants and over 150 guests from twenty seven countries, seven of them outside of the American continent. Both Professor Ralph B. Peck, President of the International Society and Mr G. Pérez-Guerra, Vice-President for South America, attended the Conference. Dr Peck presided over the Opening Session and acted as 'discusser-at-large' in all technical sessions. Mr Pérez-Guerra presided over the Closing Session and Business Meeting of the Delegates. The key-note address was delivered by Professor T. William Lambe of M.I.T.

The theme of the Conference was 'Performance of Earth Structures and Foundations', divided into six technical sessions. A seventh, non-technical, session was held, on 'Business and Practice of Foundation Engineering'.

The Proceedings of the Conference were published in three volumes by the American Society of Civil Engineers. The first two volumes were distributed at the Conference and the third appeared in 1972. Volume I contains state-of-the-art reports on the six technical sessions; Volume II, papers submitted on the theme of the Conference; and Volume III, discussions, session VII and other activities.

### 2 - LATIN-AMERICAN GEOTECHNICAL MAGAZINE

The first proposal for a regional periodical publication on soil mechanics and foundation engineering was made at the Second Pan-American Conference in Brasil, in 1963. The Venezuela National Society had started in 1960 publication of a Bulletin. From 1960 to 1972 there have appeared thirty-eight issues of the Bulletin, forty to seventy pages each, with technical papers and society news. Owing to it being the only active periodical technical publication in the region, it was proposed in Brasil to make of that bulletin the divulgation organ of technical and social activities of Latin-America but the proposal was never implemented.

In 1970 the Mexico National Society re-activated the idea of a regional publication on a Latin-American basis, i.e., all South-American national societies plus Mexico, which geographically is part of the North-American region. A lengthy consultation followed, conducted mainly by mail, complemented by personal visits of several delegates to countries of South America and Mexico. The Vice-President for North America, Dr D.H. MacDonald, was also consulted and offered valuable opinions and advice. As a result of the consultation all Latin-American national societies concurred in sponsoring a Latin-American Geotechnical Magazine as a regional technical periodical publication and designated Venezuela as publisher. The Magazine was to have a Director and four Advisors, plus a Publication Committee.

The first issue, corresponding to the second quarter of 1971, was presented to the IV Pan-American Conference in Puerto Rico. Within the program of that conference, the Latin-American delegates held a business meeting, presided over by the Vice-President for South America, in which matters related to the publication of the Magazine were considered, brought up to date and resolved upon.

By proposal of the delegates for Mexico, approved by the votes of the assembly, it was decided that the Magazine was to be fully bilingual, with versions of all papers both in Spanish or Portuguese and in English. The delegates also appointed Mr J.C. Hiedra López as Director, with residence in Caracas, Venezuela, and as advisors, Messrs. Oreste Moretto (Argentina), Victor F V de Mello (Brasil), Raúl J. Marsal (Mexico) and G. Pérez-Guerra (Venezuela). These appointments were made for the four-year period to the next meeting of the delegates which will take place at the Fifth Pan-American Conference in 1975 in Buenos Aires.

The first four issues of the Magazine were published with the financial help of the Venezuela National

Society, with the expectation that from its second year on the Magazine would pay its way through advertisements of an inter-American appeal and subscription from America and the rest of the world. This has not proved feasible with the result that the Director has not been able to publish the fifth issue, for which originals are ready for the printer. The Director has addressed a consultation to the sponsoring countries to get their views and suggestions on how to overcome these difficulties.

### 3 - CHILE NATIONAL SOCIETY

This new member of the International Society was admitted at the Sydney meeting of the Executive Committee, in 1971, by the unanimous vote of the delegates. The Vice-President for South America was charged with the pleasant duty of the Chile representation at the meeting, and on their behalf thanked the Committee for their admittance.

### 4 - SECOND PERU NATIONAL CONFERENCE

The conference took place in Lima in July 1970. The program was organized around the classical headings used in the past by International Conferences. Attendance was numerous with a high percentage of national engineers, with a certain number from other Latin-American countries.

### 5 - FOURTH BRASIL NATIONAL CONFERENCE

The Fourth Conference was realized at Rio de Janeiro in August, 1970. Five main subjects were considered: I - Research Techniques - Field and Laboratory; II - General Properties of Typical Soils; III - Earth Pressures and Retaining Structures, Deep Excavations, Subways; IV - Stability of Natural and Man-made Slopes; and V - Special Problems of Design and Construction. The conference was attended by a large number of Brazilian engineers.

### 6 - SECOND ARGENTINA NATIONAL CONFERENCE

The conference took place at the city of Córdoba in September 1970. The Proceedings of the First National Conference, held at the city of La Plata, were printed in 1971 and sample copies of the volume were circulated at the IV Pan-American Conference in Puerto Rico.

### 7 - VENEZUELA LECTURE SERIES 1972

The series consisted of nine lectures plus two round-table discussions delivered in eight meetings held in four successive weeks from mid-June to mid-July 1972. The series were organized by the Venezuela Soil Mechanics Society, the Venezuela Geological Society and the Venezuela Structural Engineering Society, under the sponsorship of the Venezuela College of Engineers. Its character was inter-disciplinarian and the maximum quota of 100 registrants was amply filled.

The lectures dealt with geological features of the city of Caracas, stability of residual soils, foundation criteria, soil-structure inter-action and seismic influence on foundation design.

## ACTIVITIES OF THE VICE-PRESIDENT

The Vice-President attended the Fourth Pan-American Conference in Puerto Rico and presided over a business meeting of the delegates in which Buenos Aires was elected as the seat of the Fifth Pan-American Conference to be organized by the Argentina National Society in 1975.

He also attended the Sydney meeting of the Executive Committee of the International Society in August 1971, acting at the meeting as delegate for Chile and Venezuela.

In November 1972 the Vice-President visited Mexico upon the gracious invitation of the Mexico National Society and joined Prof. Peck and Dr MacDonald in attending the First Nabor Carrillo Lecture given by Prof. Arthur Casagrande. The Lecture is a bi-annual affair instituted to honour the memory of the great Mexican engineer.

The Vice-President had been invited to visit Ecuador on the occasion of the Second Ecuador National Conference which was scheduled for September 1970, and to give a lecture on expansive soils. This was not realized as the Conference was postponed.

During the period the Vice-President maintained frequent correspondence with the several national societies trying to keep up to date on their activities, relaying information received from the Secretary General or requested by them and promoting subscriptions and collaboration to the Latin-American Geotechnical Magazine and the Geotechnical Abstracts.

Some correspondence was also interchanged with the Argentine National Society on matters pertaining to the organization of the Fifth Pan-American Conference in Buenos Aires.

Contacts were made by mail with groups of engineers from the Dominican Republic, Guatemala and Panamá interested in organizing national societies. Ample information was given, providing copies of the statutes of the International and Venezuela Societies, procedures for becoming a member of the International Society and the option to be incorporated into the North America or South America regions.

The Secretary General has been kept informed yearly of the activities of the region and both mail and personal communication was maintained with the Vice-President for North America on matters related to the Latin-American Geotechnical Magazine and general policy of the International Society.

## APPENDIX XI

## REPORT ON ACTIVITIES WITHIN THE ASIAN REGION, by the ASIAN VICE-PRESIDENT

SOUTHEAST ASIAN SOCIETY OF SOIL ENGINEERING - Activities Report

1. Country - Southeast Asia.
2. Name of the Society - Southeast Asian Society of Soil Engineering.
3. Officers of the Committee:

President - Professor Chin Fung Kee
Secretary - Dr John D. Nelson

General Committee Members:

| | |
|---|---|
| Mr Nasiruddin Yawar Babar | - West Pakistan |
| Dr Edward W Brand | - Thailand |
| Dr Sirilak Chandrangsu | - Thailand |
| Prof. Chin Fung Kee | - Malaysia |
| Mr Peter Lumb | - Hong Kong |
| Dr Chai Muktabhant | - Thailand |
| Dr John D. Nelson | - Thailand |
| Mr Jose C. Santos | - Philippines |
| Dr Tan Swan Beng | - Singapore |
| Mr Sawarso Wignjosajono | - Indonesia |

4. Approximate number of members - 200.
5. Meetings or Conferences:
   (i) Fourth Southeast Asian Conference on Soil Engineering. To be held in Kuala Lumpur, Malaysia, April 7 - 10, 1975. Proceedings will be available.
   (ii) Third Southeast Asian Conference on Soil Engineering. Held in Hong Kong, November 6 - 10,1972. Proceedings not yet available.
   (iii) Fourth Asian Regional Conference on Soil Mechanics and Foundation Engineering, Bangkok, July 1971. Proceedings (U.S. $30).
   (iv) Proceedings of the First Southeast Asian Conference on Soil Engineering, Bangkok, 1967, are out of print, and the Second Southeast Asian Conference on Soil Engineering, Singapore, 1970, are still available at cost of U.S. $18.00
6. Society Publications - 'Geotechnical Engineering', Semi-annual journal in English. Free to members; U.S. $3.00 per year to non-members; U.S. $8.00 per year to libraries or organizations.
7. Special Activities and Remarks

Asian Information Center for Gectechnical Engineering (AGE). The idea of establishing the AGE was conceived at a meeting of the representatives of the national societies of the Asian Region held in Bangkok in July 1971. The representatives of the Southeast Asian Society were requested to explore the feasibility of such a project. The AGE was established within the library of the Asian Institute of Technology with funding through a grant from the International Development Research Centre of Canada.

To act as a clearinghouse in the Asian region for publications and information on all phases of geotechnical engineering such as soil mechanics, foundation engineering, rock mechanics, engineering geology, earthquake engineering, and other related areas, the Center will undertake the responsibility to collect all relevant information and data useful to the region, to design a computer-based information storage and retrieval system, and to disseminate such information through its publications and photoduplication services.

Among the regular publications planned are:

Asian Geotechnical Engineering Abstracts (Quarterly)

Asian Geotechnical Engineering in Progress (Semi-annual)

Asian Geotechnical Engineering Directory (Bi-annual)

AGE Current Awareness Service (Quarterly)
(List of new publications received at AGE and the table of contents of selected AGE journals)

AGE Journal Holding List (Annual)

AGE Bibliography Series (Irregular)

The Center, in addition to its publication projects, will also provide the following three-R services:

Reference service (for bibliographical questions)

Referral service (for technical questions)

Reproduction service (for photocopying or microfilming of required documents)

Detailed information concerning the Center and the availability of its services is contained in a descriptive brochure issued by the Center. All interested persons are invited to write for a complimentary copy of the brochure from the Director, AGE/AIT, P.O. Box 2754, Bangkok, Thailand.

## ACTIVITIES OF THE INDIAN GEOTECHNICAL SOCIETY - PERIOD 1969 - 1973

1. Country - India
2. Name of the Committee - Indian Geotechnical Society
3. Officers of the Committee:

| | |
|---|---|
| President | - Dr Shamsher Prakash |
| Secretary | - Shri C.V.J. Varma |
| Executive Committee Members: | Dr T. Ramamurthy |
| | Shri B.T. Nagrani |
| | Shri H.C. Verma |
| | Prof. B.V. Ranganatham |
| | Dr B.K. Ramiah |
| | Prof. B.K. Kaul |
| | Dr Suresh P. Brahma |
| | Dr K.E. Agarwal |
| | Shri S.N. Gupta |
| | Dr Gopal Ranjan |
| | Dr M. Venkataratnam |

4. Approximate number of members - 900
5. Meetings or Conferences - A Technical Session on the subject of Soil Mechanics is held every year. Its proceedings are published in English.
6. Society Publications: (i) Indian Geotechnical Journal issued quarterly in English. Available at a cost of U.S. $12 by surface mail or U.S. $24 by air mail, per year.
   (ii) I.G.S. Newsletter issued quarterly.
7. Special Activities: (i) Symposia on 'Shallow Foundations' was arranged at Bombay in December 1970. Its proceedings are available from its publishers at a cost of $20 by surface mail or $30 by air mail.
   (ii) Symposium on 'Behaviour of Earth and Earth Structures subjected to Earthquakes and Dynamic Loads' was organized in March 1973 in Roorkee. This symposium was jointly sponsored by Indian Society of Earthquake Technology and University of Roorkee.
   (iii) Special lectures are arranged for the members of the Society whenever foreign experts on the subject of soil mechanics and foundation engineering are available for delivering such lectures.

## ACTIVITIES OF THE ISRAEL NATIONAL SOCIETY DURING THE PERIOD 1971 to 1973

1. Country - Israel
2. Name of the Society - Israel National Society of Soil Mechanics and Foundation Engineering.
3. Officers of the Society:

| | |
|---|---|
| President | - Joseph G. Zeitlen |
| Secretary | - G. Kassiff |
| Executive Committee Members: | J.G. Zeitlen |
| | G. Kassiff |
| | G. Wiseman |
| | A. Komornik |
| | Z. Getzler |
| | M. Katzir |
| | E. Zolkov. |

4. Number of Members: 110
5. Meetings or Conferences

| | |
|---|---|
| February 1971: | Symposium on Pile Foundations, Tel-Aviv |
| December 1972: | Presentation of Papers Submitted to the Moscow Conference, Tel-Aviv. |
| March 1973: | Symposium on Environmental Effects on Swelling Clay Subgrades - Tel-Aviv. |
| July 1973: | 3rd International Conference on Expansive Soils -Technion City, Haifa. |

6. Society Publications:
   Proceedings of the 3rd International Conf. on Expansion Soils, Vol.1, July, 1973. Price: $50. - (2 volumes).

7. Special Activities:
   - Preparation in final form of the draft of the Foundations Code of Practice.
   - Participation in the Committee on Earthquake Code of Practice.
   - Study group on penetration resistance practice and equipment.

## ACTIVITIES OF THE JAPANESE NATIONAL COMMITTEE DURING THE PERIOD 1969 TO 1973

1. Country - Japan
2. Name of the Committee: Japanese National Committee on Soil Mechanics and Foundation Engineering.
3. Officers of the Committee:

| | |
|---|---|
| Chairman | - Hideo Fukuda |
| Secretary | - Kenji Ishihara |
| Executive Committee Members: | Toshinobu Akagi,<br>Masami Fukuoka,<br>Yorihiko Osaki,<br>Kano Hoshino,<br>Fusayoshi Kawakami,<br>Hideaki Kishida,<br>Yasunori Koizumi,<br>Junichi Miyako,<br>Hiroshi Mori,<br>Sakuro Murayama,<br>Akio Nakase,<br>Takashi Watanabe,<br>Hakuju Yamaguchi,<br>Yoshiaki Yoshimi. |

4. Approximate Number of Members: 350
5. Meetings of Conferences:
   The activities of the Japanese National Committee are incorporated with those of the local Society, the Japanese Society of Soil Mechanics and Foundation Engineering, to which the National Committee is attached.

   (i) Proceedings of the 2nd Asian Regional Conference on Soil Mechanics and Foundation Engineering are still available at the cost of U.S. $20.00.

   (ii) Research Conference on Soil Mechanics and Foundation Engineering and Symposium on some specific topics, are held each year, and the proceeding published in Japanese.

6. Society Publications:

   (i) "Soils and Foundations". Quarterly journal in English, U.S. $5.00 per year.

   (ii) "Tsuchi to Kiso (Soil Mechanics and Foundation Engineering)" Monthly journal in Japanese.

7. Special Activities and Remarks:

   (i) Cooperative work has been done to integrate the Japanese Industrial Standard with several specifications on the part of soil mechanics and foundation engineering.

   (ii) Several study groups organized in the Society have been actively working toward making up manuals to be used by Practicing engineers and research workers. The manuals hitherto put forth involve Sampling manual (in English), Manual for laboratory soil testing, and Manual for in-situ investigation, all published in Japanese. They are available for those who pay necessary dues.

   (iii) Symposia, as follows, sponsored fully by the Society or jointly with other engineering societies were held during the period under review.
   a. The 2nd Joint Symposium on Rock Mechanics. Nov. 1970, Kyoto, Japan.
   b. The 3rd Japan Earthquake Engineering Symposium. Nov. 1970, Tokyo.
   c. International Symposium on Land Subsidence.
   d. The 2nd US-Japan Joint Symposium on Soil Dynamics.
   e. Symposium on Tunnel.
   f. Symposium on Treatment of Soft Soil Grounds and its

Efficiency.

g. Symposium on Lateral Earth Pressure on Flexible Walls.

(iv) Slide Committee established in the Society has been active in collecting a number of colored slides related primarily with laboratory testing of soils, and in-situ investigation of construction sites. The best series of these were selected, arranged and reproduced. They are being used preferably for demonstrating students or engineers what is to be typically worked out in the field of our profession. The sets of slides can be purchased from the Society.

(v) Information Committee set up in the Society has been actively working on establishing an information collection and retrieval system, dealing exclusively with the information within the country.

8. Other Committee's Activities:

a. The Committee undertook a drive to increase its membership and had an addition of about 180 new members. The drive is still under way and will see more people join the Committee.

b. Review has been made of the Committee's statutes and the up-to-date version developed is consistent with the Constitution and By-laws of the International Society as well as those of the local Society, the Japanese Society of Soil Mechanics and Foundation Engineering, to which the National Committee is attached.

APPENDIX XII

## REPORT OF COMMITTEE ON DEFINITIONS, SYMBOLS AND TERMINOLOGY

1. Title of Committee

The title of the committee seems to be a matter of some doubt. The title given above is that used by the secretary in writing to me but the title given in the agenda is 'Committee on Symbols & Units'. Other variants have appeared in different places. Now that the major item of the revision of the word lists for the lexicon has been completed, as reported below, it might be helpful to the future committee for the executive to consider the title and perhaps even to state terms of reference.

2. Specialty Session on Terminology and Definitions in Soil Mechanics, Mexico 1969

The first task undertaken was the organization of the Specialty Session on 'Terminology and Definitions' at the International Conference in Mexico in 1969. This session was chaired by Prof. Kerisel, the writer acting as secretary.

A very short report on this session was written for inclusion in the Proceedings of the conference. Later a transcript of the tape recording of the session was made and a copy was offered to everyone who was present at the session or who had corresponded with the secretary about the session. Copies of this transcript are still available. As no funds were available this was the most we could do.

Several matters arising from the session are still to be dealt with by the committee (see below).

3. International System of units (S.I.)

A matter within the duties of the sub-committee, which was first raised by Dr.Northey of New Zealand, is which system of units should be used by the International Society. Dr.Northey pointed out that when New Zealand, Australia and Great Britain changed from the foot, pound, second (f.p.s.) system they would use the 'Systeme International' (S.I.). This is not the same as the centimetre, gram, second (c.g.s.) or the metre, kilogram, second (M.K.S.) systems used by most countries which have used the metric system of units for years. There are two differences. In the S.I. the kilogram is used as a unit of mass, and the Newton is the unit of force (and therefore comes into the units of stress and pressure), a Newton being that force which will give a mass of one kilogram an acceleration of one metre per second per second. The second difference is that the S.I. uses multipliers of $10^3$ and $10^{-3}$ to move from one unit to the next greater or smaller e.g. 1 km = $1m \times 10^3$

1 gm = $1kg \times 10^{-3}$

Our Society must adopt some standard (if interim) policy on the use of units.

A letter was circulated to the Chairmen of all National Committees asking what the situation was or was likely to be in their country. Sixteen replies were received one of which was simply a formal acknowledgment.

Two countries stated unequivocally that they are now using S.I. only. They are Britain and Ireland, Poland stated that S.I. will be obligatory after 1972.

Six countries are committed to S.I. but with reservations, and six countries which are already 'metric' state that they have no intention of changing their present practice in the near future, i.e.they will continue to use c.g.s.or M.K.S.with force measured in kgf or kiloponds or metric tonnes and pressure in kgf/cm$^2$ or tonnes/m$^2$.

The reservations referred to above are of interest. Spain says S.I. is legal and is to be taught in schools, but c.g.s. and m.kp.s. units are also compatible with the law. Spain refers to c.g.s. as only 'a subsystem of the S.I.' I do not think this is basically true. France suggests giving both units on graphs and also expresses a preference for the 'bar' as a unit of pressure, one bar being equal to one decanewton per cm$^2$. West Germany says S.I. units must be used by law from 1977, but refers to the difficulty of finding 'handy multipliers for the basic unit 'Newton' which should be such as to give conventional figures in conventional statical computations', and says 'Another point, of course, will be how readily engineers will accept new units'. South Africa is committed to S.I. and 'will be completely metricated by the end of 1973', - they say further however 'it is considered by the engineering profession that in practice, for the foreseeable future engineers will use kilograms for force and kg/cm$^2$ or tonnes/m$^2$ for stress' New Zealand agrees that S.I. units should be promoted, but points out that the use of a given system of units is really a matter of personal preference and that all a society can do is to recommend the S.I. units to its members. Portugal says that the tendency in their country is to maintain S.I. and derived units like kilograms force and kgf/cm$^2$ and ton/m$^2$.

Of those countries which will remain c.g.s. or M.K.S. (i.e. NOT S.I.), Turkey does not expect a change in the near future, Hungary is deliberately using c.g.s. and M.K.S. units and awaits the introduction of 'Newtons' and everything that has to come along with that. Finland will continue to use the c.g.s. system for the time being but expects the new generation will automatically shift over to S.I. as does U.S.S.R. Czechoslavakia uses S.I. with 'one important deviation', which is that supplementary units are used in Civil Engineering practice. These are pond, kilopond and megapond for force and kp/m$^2$ and Mp/m$^2$ for pressure, and p/cm$^3$ and kp/m$^3$ for unit weight. Japan and Greece see no sign of change from the c.g.s. and M.K.S. systems.

The picture for the future is one of confusion. Clearly we are going to have with us in Civil Engineering both the S.I. and M.K.S. system for some considerable time in the future. Problems are the size of the Newton (which is small), the $10^3$ multiplier, which becomes $10^6$ for areas and $10^9$ for volumes, and the need to find conveniently sized S.I. units for force and stress.

One fact is clear; only North America is now using the f.p.s. system and Canada is committed to change to the S.I. Further the metric system has been legal in U.S.A. since 1866 and the metre and kilogram have been the legal standards of length and mass since 1893.

Although it seems that S.I. will eventually win, the sub-committee recommends to the executive committee that the f.p.s. system not be used in the activities of the International Society in future, but that as an interim measure, all quantities be given in the S.I. or M.K.S. units. In the case of force or stress, both S.I. and M.K.S. units be given, but 'kilogram' should not be used as a unit of force, 'kilogram weight' or 'kilopond' being used. 'Bar' as a unit of pressure is acceptable.

The matter should be reconsidered at a suitable future time.

4. Fourth Edition of Eight Language Lexicon

The eight language lexicon, produced through three editions by the Swiss National Society is a major contribution to our subject.

Several workers have pointed out however that some of the translations are not correct in all languages. In many cases this arises because the English word has more than one meaning.

The committee has completed the task of compiling a basic word list in English. This list contains 1590 words compared to 1633 in the third edition. However many new technical words have been added, but all non-technical words which can be found in a general dictionary have been deleted.

Where an English word can be misunderstood or has two or more meanings, the word has been defined in English in all its meanings. These definitions have been sent to the translators. The idea is that the definition should be translated into French (say) and the appropriate French word be picked to represent this meaning. The definitions will not be published. Some of them are open to criticism, but they serve their one purpose.

The preliminary suggested word lists contained many words of local usage or from related disciplines. Each committee member gave his opinion on each word in these lists. Many of these words were deleted based on the consensus of opinion.

The final word lists represent the result of many painstaking hours of work by the committee members.

The translations into the languages other than English are being made by nominees of the appropriate national committees except for German and Swedish which are being done by Prof. Schultze and Mr. Sandegren respectively who are both members of the committee.

The translations into French, German and Russian have been completed, though some final typing remains to be done.

The Swedish translations are well advanced. We understand that the Spanish translations are completed but we have not yet received all of them. We have some of the Portuguese translations. We have no information on the Italian translations.

This matter is of some urgency to our Russian colleagues and it would be appreciated if the executive could bring it to the attention of the national committees concerned.

The committee has carefully considered the question of what languages should be included in the lexicon. A case can be made for including Dutch, and either or both of Czech and Polish. We have discussed this with many friends and it is generally agreed that none of the existing languages should be dropped. If new languages are added, then the format must be changed since there is no room for additional languages within the existing format. These decisions presumably must be taken by the executive committee in conjunction with the Russian National Committee who have undertaken to print the fourth edition.

## 5. Matters outstanding

Certain matters proposed by Prof. Kerisel in his report in 1969 have not yet been formally adopted.

Other matters are 1) a confusion between the terms $s_u$ and $c_u$. Do they mean the same thing? 2) standardization of grading curves 3) a possible ambiguity in the use of the terms modulus and co-efficient 4) co-ordination of our terminology with that used in other disciplines, in particular rheology and heat flow, and 5) matter raised by Prof. Schultze of symbols proposed for quantities in soil mechanics by the International Organization for Standardization which conflict with the symbols already adopted by ISSMFE.

Correspondence on all outstanding subjects will be passed to the new chairman.

## 6. Conclusion

The present chairman retires at this point. I understand that the new chairman will be Prof. L. Jürgenson. I wish him and his colleagues well and thank the committee members who have worked with me, over the past four years for their efforts and their support.

*HQG:jb*
*71088*

*Hugh Q. Golder*
*Chairman*

## APPENDIX XIII

REPORT TO VIIIth INTERNATIONAL CONFERENCE ON SOIL MECHANICS AND FOUNDATION ENGINEERING:

### SUB COMMITTEE ON SOIL SAMPLING

At the VIIth International Conference in Mexico City, a discussion was arranged (as Specialty Session No.1) to cover the following topics:

1. The apparatus of soil sampling.
2. The procedures of soil sampling.
3. The logic of soil sampling (from the soil mechanics point of view) and
4. The quality of soil sampling.

Following the success of these discussions and the publication of the Proceedings of that Session (see Appendix A for list of titles of the 22 papers submitted), it was decided to make the theme for the period between the VIIth and VIIIth International Conferences that of 'Quality in Soil Sampling'. As the proposed first stage in this activity, a Specialty Session was arranged on this topic at the Fourth Asian Regional Conference on Soil Mechanics and Foundation Engineering. The topics to which contributions were invited were as follows:

1. The definition of sample quality.
2. The definition of processes to attain a specific quality in a soil sample in (i) technical terms, and (ii) contract specification and
3. The measurement of sample quality.

Sixteen papers were received (see Appendix B) and a useful discussion was recorded. The Proceedings have been published.

Despite the encouraging response to these Specialty Sessions and despite the evidence put forward in several of the papers to suggest that the highest quality in a soil sample was both predictable and attainable, the conclusion could be reached that there was barely enough enthusiasm - on a world wide basis - to sustain any further enquiry on this topic.

It became abundantly clear that in many countries (notably those in which the process of soil sampling follows the preparation of a specification, the calling of bids or tenders, and the acceptance of the most favourable bid - usually at the lowest price), the opportunities for achieving a high quality in soil samples are very limited. The whole technology of soil engineering has adapted itself to the often

uncritical nature of the soil samples available for study (as a consequence of the above process). In these circumstances, despite the potential for individual examples of high quality sampling coupled with subsequent studies, the engineering profession as a body appears to be quite satisfied with the status-quo.

The situation is rather different in the case of rock sampling for studies in rock mechanics. Here the profession is alert to the proper representation - in a sample - of features critical to rock behaviour and pertinent to a sample. However the field of rock sampling is not within the terms of reference of the sub-committee.

In the light of the discussions reported above it must *now be recommended that no further action should be taken to enquire into aspects of soil sampling relating to normal terrestrial soils.*

There is, however, one emerging aspect of soil mechanics in which the process of soil sampling is critical. This relates to the earthen materials of the sea floor (including any recently uplifted coastal areas). It appears that there could be considerable economic value in bringing forward at the earliest possible date, a state-of-the-art study together with research contributions on this topic.

It is recommended therefore that the attention of the Sub-Committee should be directed towards this area of study. It is proposed that, during the period between the VIIIth and the IXth International Conferences a Specialty Conference on the topic of 'Sampling of sub-aqueous earthen materials' should be convened. It is suggested that a possible date and venue for this Specialty Session could be in Hawaii in August 1974 (to coincide with the Circum-Pacific Energy and Mineral Resources Conference).

As chairman of the Sub Committee on Soil Sampling, I would be willing to convene such a specialty session at that time or on another occasion if more suitable.

It is my recommendation that this proposed activity should be of an *ad-hoc* nature only leading to a report at the IXth Conference. Following the presentation of this report on that occasion, the Sub-Committee should be disbanded.

*July 1973* *G.D. Aitchison*

## *Appendix XIII - Appendix A*

List of papers submitted to specialty session No.1 on Soil Sampling - VIIth International Conference on Soil Mechanics and Foundation Engineering Mexico 1969

Summary of replies to IGOSS Questionnaire on the State of the Art of Soil Sampling.

Proposal for "quality-classes" in soil sampling in relation to boring methods and sampling equipment
K.H. IDEL, H. MUHS and P.VON SOOS

A ramming technique for sampling non-lithified sediments.
A. DÜCKER and H.STADE

Method for extraction of undisturbed frozen cores A. DÜCKER

Sampling disturbance of soft marine clays T. BERRE, K.SCHJETNE and S.SOLLIE

The soil mechanics aspects of soil sampling in organic soils
T.KALLSTENIUS

The soil mechanics aspects of soil sampling in coarse soils
T.KALLSTENIUS

Sampling of bentonite-cement and of silt Y.LEBEGUE

A note on the soil mechanics aspects of sampling peculiar to embankment construction of soft clays
T.K. NATARAJAN and N.BANSI LAL

Soil samplers developed at the Central Building Research Institute
D. MOHAN and V.S. AGGARWAL

Sampling of very hard cohesive soil and very dense sandy soil with an improved Denison double tube sampler
S. SONE, C.TAKEMURA and S.TAJIMA

Sampling of loose saturated sands G. YAMADA and H. UEZAWA

Reducing disturbance in sampling stiff soils J.G. ZEITLEN and A. KOMORNIK

Sampling of lunar soil J.D. NELSON

Residual soil sampling practice in Brazil M. VARGAS

Snow mechanics aspects in snow sampling G. ABELE

Soil sampling in frozen ground K.A. LINNELL

Some undisturbed soil sampling methods and procedures used by the U.A. Army Engineer Waterways Experiment Station
A.L. MATHEWS

Soil anisotropy and soil sampling D. LAFEBER

Instrumentation of soil sampling operations J.G. LANG

Sub-aqueous sampling M. WOOD

Needed research on fundamental problems in soil sampling - discussion statement
M.J. HVORSLEV

General report of the Symposium on Soil Sampling, Osaka, Japan
M. FUKUOKA

List of papers submitted to specialty session 'Quality in Soil Sampling' - Fourth Asian Conference ISSMFE, Bangkok, July 1971

INFLUENCE OF SAMPLE DISTURBANCE ON SOIL PROPERTIES

The deformation of a soil sample during extrusion from a sample tube
S.SONE

Some aspects of sampling disturbance observed using a nuclear method
B. SHACKEL

The measurement of pore pressure during sampling K. SCHJETNE

Effect of sampling on some Loess characteristics D.M. MILOVIC

Forces on an open-drive sampler in stiff clay J.G. LANG

Secondary mechanical disturbance: Effects in cohesive soil samples
T. KALLSTENIUS

The predicted effect of soil sampling disturbance on the stresses and strains developed during triaxial testing C.M. GERRARD and L.J. WARDLE

MEANS OF AVOIDING OR ALLOWING FOR SAMPLE DISTURBANCE

Sampling of sand and moraine with the Swedish Foil Sampler
B.B. BROMS and A.HALLEN

Soil sampler for taking an undisturbed sample 66mm in diameter and with a maximum length of 17 metres
H.K.S.BEGEMANN

Performance of a device for sealing sample tubes J.C. HOLDEN

Some useful properties of soil to evaluate the sample quality of unsaturated volcanic ash
K.M. SAIKI

The measurement of disturbance in samples of soft clay
S.B. BROMHAM

The variation of mechanical properties of clay samples depending on its degree of disturbance
T. OKUMURA

The use of residual stress to define sample quality
J.D. NELSON, E.W. BRAND, Z.C. MOH and I.D. MASON

Evaluation of sample quality on undrained soil properties
P. RAYMOND, D.L. TOWNSEND and M.J. LOJKASEK

Influence of type of soil upon the accessibility of soil sample quality
P. von SOOS

Discussions

## APPENDIX XIV

REPORT OF INFORMATION ADVISORY COMMITTEE TO INTERNATIONAL SOCIETY FOR SOIL MECHANICS AND FOUNDATION ENGINEERING
June 15, 1973

The Information Advisory Committee (IAC) met in Madrid, Spain, at the occasion of the European Regional Conference in April, 1972. This Committee, previously named the Abstract Liaison Committee, adopted the new name by resolution at Madrid and upon subsequent approval of the Executive Committee. The Minutes of that meeting are attached.

Since the Madrid meeting, considerable progress has been made as a result of the efforts of the IAC members. The first of these is the revision of the International Geotechnical Classification System (IGC). The revision is an outgrowth of several years of use of the IGC by Nils Flodin (Swedish Geotechnical Institute), Tin Jorstad (Norwegian Geotechnical Institute), and Herbert Kuhn (German National Society) with input and review by other members of IAC. The large task of coordinating and completing the Revised IGC was performed by Nils Flodin. The revision is made part of this report with the recommendation of IAC that it be accepted by the Executive Committee and adopted by ISSMFE. Mr. Flodin's comments are also included which will explain the nature of the changes and the need therefor (see revised version, May 1973, attached).

Progress has been made concerning the improvement and marketing of Geotechnical Abstracts/Geodex Retrieval System (GA/GRS), which was named the official information retrieval system of ISSMFE by Executive Committee action in Mexico in 1969. These efforts are primarily those of Willy Norup (GRS) and Herbert Kuhn (GA), with peripheral assistance from other members of IAC, President Peck, and Secretary Nash. The results of these efforts and cooperation are expressed in Mr. Norup's letter of April 12, 1973 which is made part of this report. The Committee is grateful to Dr. Peck and Dr. Nash for their interest and active support. Dr. Peck has prepared letters of endorsement of GA/GRS which have assisted in the sales promotion of this service, and Dr. Nash has assisted in supporting placement of advertisements at reduced rates. GA/GRS brochures have been mailed with the ISSMFE Directory with the cooperation of Dr. Peck and Dr. Nash.

Secretary Nash has attempted to enlist the assistance of the various national committees in promoting GA/GRS but has not received good response. IAC has been informed of United States National Committee cooperation via announcements in ASCE publications and obtaining of ASCE/SMFD mailing lists, but has not been informed of cooperation from any other national societies. IAC suspects that the major problem is one of lack of funds within the national committees to effect the required promotion. Nevertheless, this committee shares Dr. Nash's disappointment in the lack of cooperation of many of the national committees; the goals of 50% increase in subscriptions by the end of 1971 and 100% increase by the end of 1972 set by the Executive Committee have hardly been met. It has been necessary, therefore, to increase the subscription rate for the combined GA/GRS from $98 (U.S.) to $178(U.S.) in order to make this a self-supporting enterprise.

Several improvements are planned for the GA/GRS system, including increasing the number of key words for retrieval, preparing a manual concerning the use of the system, cross indexing of descriptors that are not key words, and improving the abstracting of paper discussions. If these things are to be done, assistance will be required of ISSMFE and the national committees to increase the number of subscribers. IAC recommends that the Executive Committee assist in the following manner:

1. Insert GA/GRS advertisements and announcements, free of charge, in directories and conference bulletins.
2. Updated national membership lists should be furnished to IAC, as soon as they become available, for use in promotion of GA/GRS.
3. Exert pressure on all national committees to endorse GA/GRS via their newsletters or technical publications.
4. Assist in obtaining reduced rates for advertisements in geotechnical journals (Secretary Nash has already given some assistance in this area).
5. Ask all conference organizers (International and Regional) to forward lists of participants and their addresses to IAC for use in promotion of GA/GRS.

It is hoped that the Executive Committee will find this report informative and constructive. The Information Advisory Committee looks forward to the Executive Committee's response and direction.

*Respectfully submitted,*

*Joseph M. deSalvo, Chairman*
*Nils Flodin, Jacques Florentin, Ivan Sovinc,*
*H. Petermann, Herbert Kuhn, Willy Norup.*

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INTERNATIONAL GEOTECHNICAL CLASSIFICATION SYSTEM

(IGC) Revised Version May, 1973

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PRINCIPAL GROUPS.

A GENERAL
B ENGINEERING GEOLOGY - Including descriptions and case records of natural processes concerning soils and rocks
C SITE INVESTIGATIONS - Equipment and techniques of exploration, sampling and field testing of soils and rocks (excluding determination of engineering properties)
D SOIL PROPERTIES: LABORATORY AND FIELD DETERMINATIONS - Concepts, theories, methods of determination, equipment and results.
E ANALYSIS OF SOIL-ENGINEERING PROBLEMS - Theoretical, empirical and practical methods of analysis
F ROCK PROPERTIES: LABORATORY AND FIELD DETERMINATIONS - Concepts, theories, methods of determination, equipment and results
G ANALYSIS OF ROCK-ENGINEERING PROBLEMS - Theoretical, empirical and practical methods of analysis
H DESIGN, CONSTRUCTION AND BEHAVIOUR OF ENGINEERING WORKS - Descriptions; case histories; syntheses of investigations, design, construction (including equipment) and behaviour
K CONSTRUCTION METHODS AND EQUIPMENT - Including improvement of soil and rock conditions
M MATERIALS OF CONSTRUCTION
S SNOW AND ICE MECHANICS AND ENGINEERING
T RELATED DISCIPLINES

A GENERAL

| Main Divisions | | Possible Subdivisions | |
|---|---|---|---|
| A01 | Foundation, Soil and Rock Engineering - Scope | A01 | General aspects<br>Economical aspects<br>Scope<br>Relation to other sciences |
| A02 | Historical Aspects | A02 | Awards<br>Biographies<br>History<br>Obituaries |
| A03 | Bibliographies and Literature Classification | A03 | Bibliographies<br>Literature classification<br>Information services<br>Abstracts |
| A04 | Textbooks, Handbooks and Geotechnical Periodicals | A04 | Handbooks<br>Periodicals<br>Publication series<br>Textbooks |
| A05 | Nomenclature | A05 | Definitions<br>Descriptors<br>Dictionaries<br>Nomenclature<br>Symbols |
| A06 | Companies, Institutes, and Laboratories | A06 | Companies<br>Consultants<br>Councils<br>Firms<br>Institutes<br>Laboratories<br>Annual reports |
| A07 | Societies and Meetings | A07 | Conferences<br>Societies<br>Committees<br>Symposia<br>Special lectures<br>Conference proceedings<br>Bulletins |
| A08 | Professional Ethics, Legal Requirements, Codes of Practice and Standardization | A08 | Accidents<br>Bidding practice<br>Building codes<br>Calculated risks<br>Codes of practice<br>Ethics<br>Legal requirements<br>Liability<br>Loss prevention<br>Performance standards |
| A09 | Education | A09 | Universities and colleges<br>Continuing education<br>Geotechnical curricula |

B ENGINEERING GEOLOGY Including Descriptions and Case Records of Natural Processes concerning Soils and Rocks.

| Main Divisions | | Possible Subdivisions | |
|---|---|---|---|
| B00 | General | | |
| B01 | Soils and Rocks Formation | B01 | Deposits - general features<br>Deposits - special features<br>Prospecting of deposits for special purposes<br>Residual deposits<br>Alluvial deposits<br>Lacustrine deposits<br>Marine deposits<br>Glacial deposits<br>Wind deposits<br>Volcanic deposits |

| | | |
|---|---|---|
| | | Boulder deposits<br>Organic terrain<br>Geochronology<br>Accumulation and removal of constituents<br>Geologic periods aspects<br>Geologic preloading<br>Igneous rocks<br>Sedimentary rocks<br>Metamorphic rocks |
| B02 | Hydrogeology | B02 Ground water origin and occurrence<br>Fluctuations of ground water level<br>Ground water types<br>Ground water movements<br>Water in rock fissures<br>Quality of water<br>Surface water features |
| B03 | Mass Movements and Subsidence | B03 Slow soil flow, creep<br>Solifluction<br>Landslides<br>Land subsidence |
| B04 | Natural Catastrophes | B04 Earthquakes<br>Floods<br>Waves |
| B05 | Climatological Features | B05 Frost fundamentals<br>Permafrost features<br>Arid land<br>Tropical zones<br>Subtropical zones |
| B06 | Submarine Geology | B06 Submarine erosion<br>Submarine sedimentation<br>Submarine topography<br>Turbidity currents |
| B07 | Structural Geology | |
| B08 | Extraterrestrial Geology | B08 Lunar geology<br>Lunar soils |
| B09 | Geomorphology and Terrain Classification | B09 Erosion, subaerial<br>Exogenetic processes<br>Slope development<br>Terrain classification |
| B10 | Mineralogy and Petrography | B10 Clay minerals<br>Crystallography<br>Mineralogy<br>Diagenesis<br>Metamorphism<br>Petrography |
| B11 | General Descriptions of Regional Soils and Rocks Conditions | B11 General geological - geotechnical maps |

C SITE INVESTIGATIONS Equipment and Techniques of Exploration, Sampling and Field Testing of Soils and Rocks (excluding determination of engineering properties)

| Main Divisions | | Possible Subdivisions |
|---|---|---|
| C00 | General | C00 Site investigations - planning<br>Data storage and retrieval<br>Quality requirements<br>Site inspection<br>Pre-construction field observations |
| C01 | Airphoto Surveys | |
| C02 | Geophysical Surveys | C02 Geophysical methods - general<br>Seismic survey<br>Electrical methods |

| | | |
|---|---|---|
| | | Gravity methods<br>Magnetic methods<br>Sonic methods<br>Remote sensing<br>Laser method |
| C03 | Probings (Soundings) | C03 Dynamic probing<br>Static probing<br>Wash probing |
| C04 | Exploratory Excavations | |
| C05 | Boring Technique and Equipment and Recording of Results | C05 Boring technique - general<br>Boring methods and equipment<br>Coring technique<br>Drill rigs and auxiliary equipment<br>Boring platforms<br>Recording of boring results, including down-hole techniques (boring logs)<br>Submarine boring<br>Drilling mud<br>Horizontal-boring technique |
| C06 | Sampling, Handling of Samples | C06 Sampling - general<br>Handling of samples<br>Sample quality requirements |
| C07 | Measurement of Field Conditions | C07 General field instruments<br>Deformation, settlement<br>Inclinometer measurements<br>Ground water table<br>Ground water flow<br>Tracer studies<br>In situ stress<br>Earth pressure measurements<br>Pore-water pressures<br>Recording of meteorological conditions |
| C08 | Field Testing<br>Excluding tests for engineering properties, see Groups D and F | C08 Seepage tests, pumping tests<br>Plate bearing tests<br>Pile load tests<br>Rock drilling tests<br>Blasting tests<br>Full-scale load tests |
| C09 | Reports on Site Investigations | C09 Reports<br>Presentation of results<br>Drawings<br>Maps |

D SOIL PROPERTIES: LABORATORY AND FIELD DETERMINATIONS — Concepts, Theories, Methods of Determination, Equipment and Results

| Main Divisions | | Possible Subdivisions |
|---|---|---|
| D00 | General | D00 Laboratory supplies<br>General testing equipment<br>General geotechnical testing |
| D01 | Classification and Identification | D01 Soil classification<br>Consistency limits, incl. water content<br>Description of specific soils |
| D02 | Physico-chemical properties | D02 Soil-water relationship<br>Physical properties incl. electrical properties<br>Chemical properties<br>Corrosion<br>Thixotropy<br>Deterioration<br>Dispersion<br>Ageing effects<br>Formation of quick clays<br>Effects of organic components |

| | | |
|---|---|---|
| D03 | Composition, Structure and Density | D03 Soil composition<br>Grain size, shape and surface area<br>Grain size distribution<br>Soil structure, fabric<br>Porosity<br>Density, degree of saturation<br>X-ray analysis<br>Differential thermal analysis (DTA) |
| D04 | Permeability and Capillarity | D04 Fundamental flow properties<br>Determination of permeability and capillarity<br>Filter properties |
| D05 | Compressibility | D05 Fundamental properties<br>Compressibility and swelling<br>Consolidation<br>Oedometer tests<br>Secondary time effects<br>Repetitive loading |
| D06 | Shear-deformation and Strength Properties | D06 Fundamental properties<br>Stress-strain properties<br>Shear strength<br>Elastic properties<br>Failure criteria<br>Dilatancy<br>Anisotropy<br>Tensile tests<br>Compression tests, incl. triaxial<br>Residual strength<br>Direct shear tests<br>Visco-elastic properties<br>Vane tests<br>Sensitivity<br>Fall-cone tests<br>Static penetration test in laboratory<br>Pore pressure<br>Rheological features<br>Field direct shear tests<br>Resistance against cutting |
| D07 | Dynamic Properties | D07 Blasting tests<br>Vibration tests |
| D08 | Thermal Properties | D08 Thermal properties<br>Freezing properties |
| D09 | Compactibility | D09 Fundamental properties<br>Compaction tests<br>Compaction test equipment |
| D10 | Properties of Soil-Additive Mixtures | D10 Additives<br>Soil mixtures<br>Stabilized soils |

| E ANALYSIS OF SOIL-ENGINEERING PROBLEMS | Theoretical, Empirical and Practical Methods of Analysis |
|---|---|
| Main Divisions | Possible Subdivisions |
| E00 General | E00 Safety factors in general<br>Model laws |
| E01 In Situ Stresses Caused by Gravity and Applied Loads and Excavations | E01 Basic theories<br>Stresses caused by gravity<br>Stress distribution from vertical loads<br>Stress distribution from horizontal loads<br>Stress distribution from inclined loads<br>Contact pressures<br>Elastic features<br>Photo-elastic analysis |
| E02 Deformation and Settlement Problems | E02 Basic theories<br>Settlement analysis<br>Consolidation theories<br>Secondary time effects<br>Creep and plastic flow |

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|---|---|---|
| | | Preloading and unloading<br>Settlements due to ground water lowering<br>Regional settlements<br>Settlement of piles and pile groups<br>Settlements due to climatic conditions. vegetation.etc<br>Settlements due to dynamic and repetitive loadings<br>Consolidation by atmospheric pressure<br>Heaving<br>Anchor movements<br>Swelling due to unloading |
| E03 | Bearing Capacity of Soils | E03 Basic theories<br>Bearing capacity of footings<br>Foundation failure of embankments |
| E04 | Bearing Capacity of Piles | E04 Basic theories<br>Bearing capacity of individual piles<br>Pull-out resistance<br>Pile driving formulae and problems<br>Bearing capacity of pile groups<br>Piles and pile groups subjected to lateral forces<br>Negative skin friction<br>Evaluation of pile load tests |
| E05 | Earth Pressure Problems | E05 Basic theories<br>Earth pressure on retaining walls<br>Earth pressure on temporary supports<br>Earth pressure on free and anchored sheet piles<br>Earth pressure on anchor plates<br>Stability of double wall and cellular cofferdams<br>Earth pressure on tunnels and shafts<br>Earth pressure on conduits<br>Silo pressure<br>Water pressure, incl. from waves<br>Wind loads |
| E06 | Stability of Slopes, Fills, Cuts and Excavations | E06 Basic theories<br>Stability of natural slopes<br>Stability of cuts and excavations<br>Stability of embankment and fill slopes |
| E07 | Seepage and other Hydraulic Problems | E07 Basic theories<br>Seepage to wells and drains<br>Seepage into excavations<br>Seepage through and below dams<br>Piping, heave and internal erosion<br>Liquefaction<br>Surface water erosion<br>Wave actions |
| E08 | Dynamic Problems | E08 Basic theories<br>Impact problems<br>Machine foundations<br>Earthquake effects<br>Blast effects<br>Wave propagation<br>Dynamic response<br>Wind effects |
| E09 | Frost Action and Heat-transfer Problems | E09 Basic theories<br>Temperature distribution in soil<br>Thermodynamic conditions<br>Heat exchange at ground surface<br>Frost penetration<br>Frost problems related to structures |
| E10 | Analysis of Base Courses and Pavements Behaviour | |
| E11 | Soil-vehicle Interaction (trafficability) | E11 Trafficability<br>Terra mechanics |
| E12 | Soil-Structure Interation | |
| E13 | Computer Analysis | E13 Computer analysis<br>Finite element method |

F ROCK PROPERTIES; LABORATORY AND FIELD DETERMINATIONS — Concepts, theories, Methods of Determination, Equipment and Results

| Main Divisions | | Possible Subdivisions[1] | |
|---|---|---|---|
| F00 | General | F00 | Laboratory supplies<br>General testing equipment |
| F01 | Classification and Identification | F01 | Rock classification<br>Rock identification<br>Rock hardness (drillability)<br>Rock quality (incl.recovery, velocity ratio, fracture frequency)<br>Fissure patterns<br>Joints survey |
| F02 | Physico-chemical Properties | F02 | Geochemical properties of rock<br>Weathering resistance |
| F03 | Composition, Structure and Density | F03 | Density and porosity<br>Composition<br>Structure<br>Planes of cleavages and beddings<br>Folding<br>Cavities |
| F04 | Permeability and Capillarity | F04 | Permeability<br>Capillarity |
| F05 | Compressibility and Swelling | F05 | Compressibility<br>Swelling<br>Time effects |
| F06 | Shear-Deformation and Strength Properties | F06 | Elastic properties<br>Plastic properties<br>Compression strength<br>Tensile strength<br>Residual strength<br>Joint strength<br>Rheological features |
| F07 | Dynamic Properties | F07 | Blasting tests<br>Vibration tests |
| F08 | Special Properties of Rock | F08 | Thermal properties<br>Electric properties<br>Magnetic properties |

G. ANALYSIS OF ROCK-ENGINEERING PROBLEMS — Theoretical, Empirical and Practical Methods of Analysis

| Main Divisions | | Possible Subdivisions[1] | |
|---|---|---|---|
| G00 | General | G00 | Safety factors in general |
| G01 | In Situ Stresses caused by Gravity, Tectonics, Applied Loads and Excavations | G01 | Stress release due to excavation<br>Stresses due to swelling clays<br>Anchor stresses<br>Rock burst |
| G02 | Deformation Problems | | |
| G03 | Bearing Capacity of Rock | | |
| G04 | Stability of Slopes, Excavations and Openings | | |
| G05 | Seepage and other Hydrologic Problems | | |
| G06 | Dynamic Problems | G06 | Basic theories<br>Earthquake effects<br>Wave propagation<br>Dynamic response |
| G07 | Frost Action and Heat-transfer Problems | | |
| G08 | Computer Analysis | G08 | Computer analysis<br>Finite element method |

1. To be further considered

H DESIGN, CONSTRUCTION AND BEHAVIOUR OF ENGINEERING WORKS Descriptions; Case Histories; Syntheses of Investigations, Design, Construction (including equipment and materials) and Behaviour

| Main Divisions | | Possible Subdivisions | |
|---|---|---|---|
| H00 | General | H00 | General contracts<br>General specifications<br>Failures in general |
| H01 | Foundations of Structures | H01 | Shallow foundations<br>Piled foundations<br>Deep foundations, excluding piles<br>Buildings<br>Bridges<br>Tanks<br>Towers<br>Masts |
| H02 | Retaining Structures, Cut-off Walls and Concrete Dams | H02 | Retaining walls<br>Sheet-pile walls<br>Cellular cofferdams<br>Cut-off walls<br>Sheeted excavations<br>Tied-back walls<br>Concrete Dams<br>Reservoirs |
| H03 | Unsupported Excavations | H03 | Open cuts<br>Open pits |
| H04 | Earth and Rock Fill Dams and Earth Embankments | H04 | Earthworks<br>Embankments<br>Fills and dumps<br>Earth-fill dams<br>Rock-fill dams<br>Tips<br>Tailings |
| H05 | Underground Structures | H05 | Tunnels in soil<br>Tunnels in rock<br>Shafts<br>Mines |
| H06 | Base Courses and Pavements of Roads, Railroads and Airfields | H06 | Airfields<br>Railroads<br>Roads |
| H07 | Harbours, Canals and Coastal Protective Projects | H07 | Harbours<br>Canals<br>Coastal protective projects<br>River regulation projects<br>Docks<br>Dolphins<br>Jetties<br>Groins |
| H08 | Conduits and Culverts | H08 | Conduits<br>Culverts<br>Pipelines |
| H09 | Slopes | H09 | Slopes |
| H10 | Land Use | H10 | Land use<br>Urban and regional planning |

## K CONSTRUCTION METHODS AND EQUIPMENT

Including improvement of soil and rock conditions

| Main Divisions | | Possible Subdivisions | |
|---|---|---|---|
| K00 | General | K00 | Economical aspects |
| K01 | Dewatering and Drainage | K01 | Vertical drainage, incl. sand and paper drains<br>Ground water lowering<br>Dewatering by electro-osmosis<br>Deep wells, incl. well points |
| K02 | Sealing and Grouting Processes | K02 | Sealing processes<br>Grouting<br>Injection |
| K03 | Preloading and Soil Replacement | K03 | Preloading processes<br>Soil replacement by pressing<br>Soil replacement by blasting |
| K04 | Soil and Rock Excavation, Processing and Transportation | K04 | Soil excavation<br>Rock excavation<br>Rock blasting and boring methods<br>Tunnelling processes<br>Nuclear explosives<br>Rippability<br>Soil cutting processes<br>Transportation of masses |
| K05 | Compaction Processes | K05 | Tamping<br>Rolling<br>Vibration<br>Vibroflotation<br>Falling body<br>Blasting<br>Ponding<br>Densification by piles |
| K06 | Soil Stabilization and Erosion Control | K06 | Mechanical stabilization<br>Chemical stabilization (lime, cement etc.)<br>Thermal stabilization<br>Reinforcement of soil<br>Erosion control |
| K07 | Piles and Pile Driving | K07 | Pile types<br>Pile driving rigs<br>Pile driving procedures<br>Sheet piling<br>Physiological aspects, e.g. reduction of noise |
| K08 | Foundation of Caissons and Deep Piers | K08 | Caissons<br>Deep piers |
| K09 | Construction Methods for Shallow Foundations | K09 | Foundation of footings, slabs and mats<br>Under pinning |
| K10 | Slurry-assisted Construction of Foundation and Cut-off Walls | K10 | Diaphragm walls<br>Cut-off walls |
| K11 | Supports of Soil and Rock | K11 | Anchorages<br>Bracing<br>Linings<br>Reinforcement<br>Shotcrete<br>Concrete support<br>Tied-back walls<br>Tunnel supports |
| K12 | Deep-water Construction Methods and Equipment | K12 | Dredging<br>Deep-water construction<br>Barge dumping |
| K13 | Frost Protection Works | K13 | Drainage operations<br>Placing of special fill materials<br>Protective plastic boards<br>Exchange of soil materials |
| K14 | Surface Techniques for Improving Deformation and Stability Conditions | K14 | Coated (reinforced) fabrics<br>Fascine mats<br>Loading berms<br>Light-weight fills (e.g. expanded clay, bark, saw dust)<br>Timber grillages |

## M MATERIALS OF CONSTRUCTION

| Main Divisions | | Possible Subdivisions | |
|---|---|---|---|
| M00 | General | | |
| M01 | Steel | M01 | Steel durability<br>Steel profiles |
| M02 | Wood | M02 | Wood as construction material<br>Wood durability |
| M03 | Bituminous Materials | M03 | Asphalt<br>Asphaltic concrete<br>Bitumen<br>Filler<br>Mastics |
| M04 | Plastics and Similar Materials | M04 | Nylon<br>Resin<br>Plastics |
| M05 | Cement and Chemicals | M05 | Cement<br>Lime |
| M06 | Concrete | M06 | Air entrainment<br>Concrete<br>Concrete aggregates<br>Concrete durability<br>Concrete testing |
| M07 | Paints and Coatings | M07 | Coatings<br>Paints |
| M08 | Construction Elements | M08 | Bricks<br>Rockwool |

## S SNOW AND ICE MECHANICS AND ENGINEERING

| Main Divisions | | Possible Subdivisions | |
|---|---|---|---|
| S00 | General | | |
| S01 | Snow and Ice Cover | S01 | Snow occurrence and depth<br>Avalanches<br>Glaciers<br>Ice cover on water bodies |
| S02 | Properties of Snow and Ice | S02 | Physical Properties of snow<br>Physical properties of ice<br>Thermodynamics of ice-water systems |
| S03 | Snow and Ice Engineering | S03 | Snow and ice as structural materials<br>Snow and ice removal<br>Protection methods and structures against snow and ice |

## T RELATED DISCIPLINES

| Main Divisions | | Possible Subdivisions[1] | |
|---|---|---|---|
| T00 | General | T00 | Research and development<br>Economical aspects |
| T01 | Pure Sciences | T01 | Chemistry<br>Mathematics<br>Physics, incl. rheology in general<br>Computer science<br>Finite element method in general |
| T02 | Geosciences | T02 | Geochemistry<br>Geology, incl. soil science<br>Geophysics<br>Geography<br>Hydrology<br>Seismology |
| T03 | Agriculture and Pedology | | |
| T04 | Meterology and Climatology | | |
| T05 | Biosciences | T05 | Botany<br>Zoology |

| | | |
|---|---|---|
| T06 | Civil Engineering | T06 Building industry<br>Coastal engineering<br>Concrete technology<br>Construction<br>Geodesy, incl. surveying and mapping<br>Highway and railway engineering<br>Hydraulic engineering<br>Irrigation and drainage engineering<br>Pipelines<br>Power engineering<br>Sanitary engineering<br>Structural engineering<br>Town and regional planning<br>Transport engineering<br>Waterways and harbours |
| T07 | Mining Engineering and Ore Prospecting | |
| T08 | Mechanical Engineering | |
| T09 | Electrical Engineering | |
| T10 | Ocean Engineering | |
| T11 | Military and Naval Engineering | |
| T12 | Instrumentation and Measuring Technique | |
| T13 | Library Science | T13 Documentation<br>Retrieval techniques |
| T14 | Environmental Problems and Nature Conservation | |
| T15 | Oil Prospecting | |

1. To be further considered